# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

*Vol. 69: No. 2.* *New York, Thursday, January 9, 1902.* $5.00 a Year, including Postage. Single Copies, Ten Cents.



Smithsonian Institute Washington D.C. 1902



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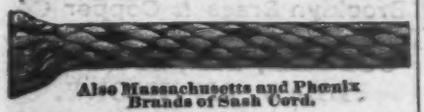

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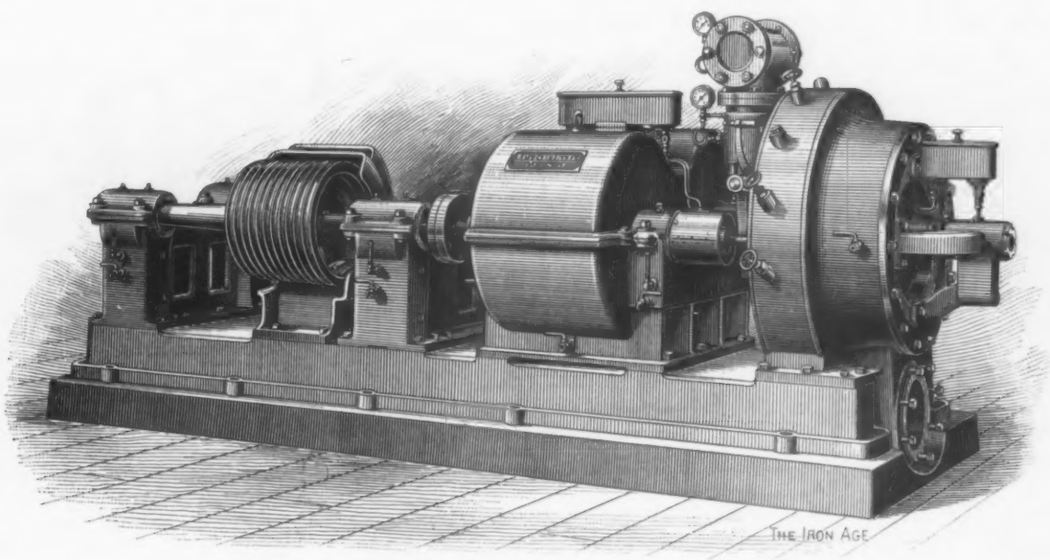
# THE IRON AGE

THURSDAY, JANUARY 9, 1902.

## The De Laval Steam Turbine.

While the De Laval steam turbine has been introduced quite extensively in Europe during the past seven years and is generally accepted as an economical and reliable source of power, it is not so well known in this country. The reason for this lies in the fact that the parent company demanded such a sum for the manufacturing rights as to make prohibitory its building here until after its true worth had been thoroughly demonstrated in practice. Now the De Laval Steam Turbine Company of 74 Cortlandt street, New York, have acquired the privilege of introducing the turbine in the United States, Mexico and Central and South America, and have established fully equipped shops at Trenton, N. J. They thus enter the field, having the wide experience of the original company as a valuable asset.

Two of the most important features of this engine are the diverging steam nozzle and the flexible shaft. This form of nozzle transforms the entire static energy of the steam into kinetic. The flexible shaft is introduced to overcome the impossibility of producing a wheel accurately enough balanced to revolve about its center of gravity at a velocity sometimes as high as 1350 feet per second without causing a side pressure destructive to plain bearings and a rigid shaft.




THE DE LAVAL STEAM TURBINE OF 300 HORSE-POWER.

The general design of the engine will be understood from the accompanying drawings. The steam, after passing through the governor valve C, Fig. 4, enters the steam chamber D, where it is distributed to the various nozzles. These, according to the size of the machine, range in number from 1 to 12. They are generally fitted with shutting off valves, E, Fig. 2, by which one or more nozzles can be cut out when the turbine is not loaded to its full capacity. This allows steam of boiler pressure to be almost always used, and adds to the economy on light loads. After passing through the nozzles the steam is now completely expanded and in flowing through the buckets F its kinetic energy is transferred to the turbine wheel. After performing its work it passes into the chamber G and out through the exhaust opening H.

The velocity of the wheel and shaft, in most cases too great for practical utilization direct, is considerably reduced by means of a pair of spiral gears, usually made 10 to 1 and placed in the gear case 1. The pinion J is made solid with the flexible shaft and engages the gear K, Fig. 3. This latter is forced upon the shaft L, which with the couplings M connects to the dynamo, or is extended for a pulley. The governor O is held with a taper shank in the end of the shaft L and by means of the bell crank P operates the governor valve C.

The flexible shaft is supported in three bearings, Q and R being the pinion bearings and S the main shaft bearing which carries the greater part of the weight of the wheel. The latter bearing is self aligning, and is held to its seat by the spring and cap shown. The flexible bearing is shown at T. This is entirely free to oscillate with the shaft, and its only purpose is to prevent escape of steam when running non-condensing or air from entering the wheel case when the turbine is running condensing. All the bearings of the flexible shaft, as well as the gear wheel, are lubricated from a central oil reservoir, U, mounted upon the gear case; all other bearings are self oiling. The bearings are plain and simple in construction and made in two halves, so as to easily be taken out and examined. They are lined with the best quality anti-friction metal, are reamed true, round and to exact size, and have the outside surface ground to insure perfect fitting and alignment. The bearings even in the largest sizes are removed and replaced without raising the shaft from its seat.

The gear wheels are made of solid cast steel, or of cast iron with steel rims pressed on. The teeth, in two rows, are set at an angle of 30 degrees to each other. This, while insuring smooth running, at the same time checks any tendency of the wheel and shaft to move lengthwise, thereby making a troublesome thrust bearing unnecessary. The gears are cut on automatic machines designed specially for this purpose, and a degree of accuracy has been attained not heretofore approached in gear wheel production. Owing to the high speed of the gears and their perfect alignment the stress on the teeth is extremely small, and gears which have been examined after continuous operation for seven or eight years show no appreciable wear.

The flexible shaft is mainly supported on each side

of the pinion by main bearings Q and R, which are placed a considerable distance apart. The shaft is at the same time made very slender, which gives it a certain amount of flexibility and allows the turbine wheel, when the so-called critical speed is reached, to revolve around its true center of gravity. This critical speed, dependent upon the flexibility of the shaft, occurs well below the normal speed of the turbine and marks the disappearance of all vibrations.

The turbine wheel is by far the most important part of the engine, and in its present form is the result of numerous experiments, both as to shape and material. It is made of forged nickel steel, and will withstand more than double the normal speed before showing signs of distress. In the smaller sizes the turbine wheels have a hole through the center and are forced upon a taper sleeve shrunk onto the shaft. The larger wheels are made solid, with the shaft in two pieces screwed to the flanges of the wheel. The buckets are drop forged and made with a bulb shank fitted in slots milled in the rim of the wheel. By this method the buckets can easily be taken out and new ones inserted, should occasion require, without damage to the wheel.

With the high speed employed in this turbine a governor of small dimensions and yet very effective can be used. The governor shown in detail (Fig. 5) is compact and simple in construction. The two weights, B, are pivoted on knife edges A, with hardened pins, C, bearing on the spring seat D. The governor body E is fitted in the end of the gear wheel shaft K, and has seats milled for the knife edges A. It is afterward reduced in diameter to pass inside of the weights, and is in its outer end threaded for the adjusting nut I, by means of which the spring and eventually the speed of the turbine is adjusted. When the speed exceeds the normal the weights affected by the centrifugal force spread apart and pressing on the spring seat D push the governor pin G forward, cutting off part of the flow of steam.

The vacuum valve is only necessary when running condensing, as in this case it has been found that the governor valve alone is unable to hold the speed of the turbine within the desirable narrow limit during sudden and great changes in the load. The function of the vacuum valve is as follows:

The governor pin G actuates the plunger H screwed into the bell crank L, however, without moving the plunger relative to said crank. This is on account of the spring M being stiffer than the spring N, whose purpose is to keep the governor valve open and the plunger H in contact with the governor pin. When a large part of the load is suddenly thrown off the governor opens, pushing the bell crank in the direction of the vacuum valve T. This closes the governor valve, which is completely shut off when the bell crank is pushed so far forward that the screw O barely touches the valve stem J. If this is not sufficient to check the speed the plunger H is pushed forward in the now stationary bell crank and opens the vacuum valve. This allows the air to rush into the space P, where the turbine wheel revolves, effectually checking its speed.

The diagram, Fig. 7, which shows the comparative efficiency of a compound condensing Corliss engine and a De Laval steam turbine is self explanatory.

In this turbine the frictional loss is practically nil. The efficiency is high with variable loads and the regulation is close. There are no moving parts under pressure and no leakage from wear, as there are no stuffing boxes, glands or packed joints.

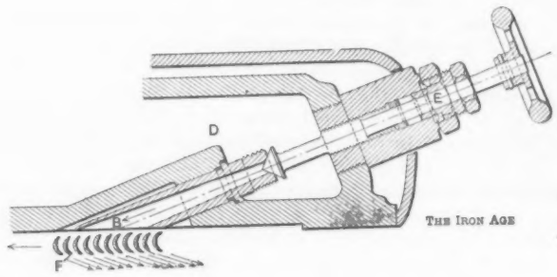



*Fig. 2.—Steam Nozzle.*

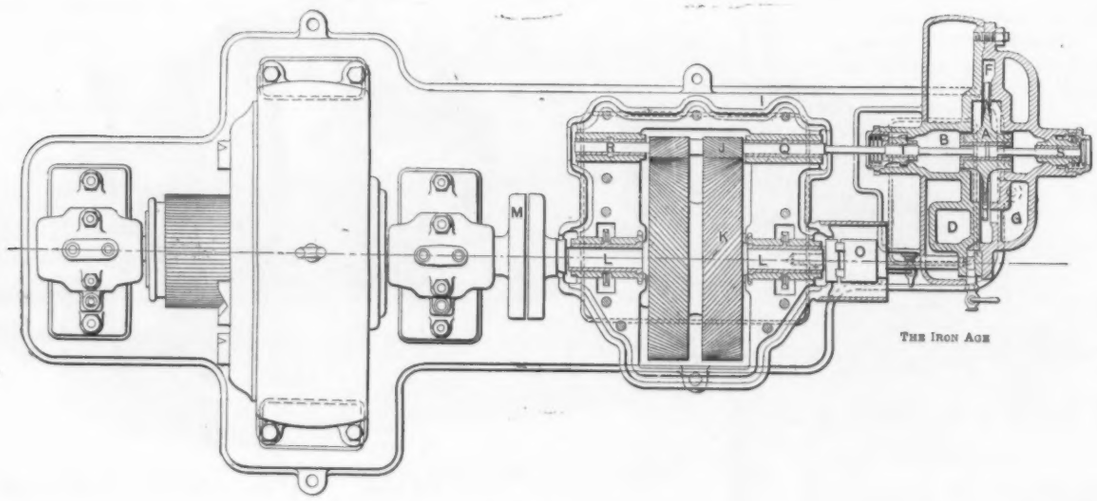



*Fig. 3.—Sectional Plan Turbine and Connected Dynamo.*

THE DE LAVAL STEAM TURBINE.

**A Blast Furnace at Delray, Mich.**—A movement is now on foot contemplating the erection of a blast furnace at Delray, near Detroit, Mich., which will use coke from by-product coking ovens. It is stated that one of the largest pig iron firms in the country will take a financial interest in the new enterprise.

Reports to R. G. Dun & Co. show that failures for the year 1901 were 11,002 in number and $113,092,376 in amount of liabilities, while of banking and other fiduciary institutions there were 74 insolvencies, involving $18,018,774, a total of 11,076 defaults and $131,111,150 liabilities. These figures compare very favorably with the 10,833 failures in 1900 with liabilities of $174,113,236, of which 59 were banks for $35,617,563. Manufacturing disasters in 1901 numbered 2441 with an indebtedness of $44,960,983, compared with 2409 in the previous year owing $51,702,142, while there were 7965 suspensions of traders for $52,060,640, against 7844 in 1900 with liabilities of $59,415,592.

## American Structural Work in the British Colonies.

A manufacturer writing in the *Engineer* has a good deal to say about structural work in the British colonies. Adverting to the surprise which was felt in England when the Atbara Bridge contract was given to America, he points out that the time clause is always inserted in the colonial specifications, but practically never insisted upon. In this case, however, the British Government was seriously resolved to obtain a quick delivery, and accordingly designs were asked for, the only stipulations as to drawings being that such and such weights were to be allowed for in calculations of strengths, &c. This British manufacturer proceeds: "But the specification was not altered, and the contractor never dreamed of departing from or altering in any way that irreproachable document. He well knew that that would not be allowed. Some tenders were duly sent in, but to every one's great surprise, when the contracts were allotted, it was found that they had gone out of the country—had been secured by America. Then arose the outcry. It was soon known that foreign enterprise had routed the old conditions, and that the tender had been awarded on special designs to a special specification. The manifest injustice of this hit the English firms very hard. Yet perhaps the loss of this work may be of direct gain to us. It has, at all events, succeeded in opening the eyes of many people to the possibilities for the trade, were the manufacturer given a little latitude and discretion in his work. For too long has he been hidebound by paper specialists—men who have had mainly a theoretical training, and whose reasoning therefore runs in certain well defined and prettily enunciated grooves." A point of importance raised by this manufacturer is that of transport, and here he gives the palm unreservedly to America. "As regards cost of transport, the favorite type of America easily carries the palm; pin truss work—very much out of favor in this country—is not surpassed for ease of dismantling, packing, stowing for transport and re-erection in place. This type of bridge work, first made in this country, has been fostered and improved by the American plan of doing business. Its cheapness, when properly and economically designed, early appealed to the business instincts of a commercial people. It was quickly seen that pin connections would make a much cheaper bridge, span for span, than the riveted type, and efforts were made by the interested firms to obviate as far as possible the inherent weakness of the system. In this country its drawbacks, soon recognized, were allowed to stay its evolution for many years; but in the States they were tackled, and pin truss work early became an American feature. Whatever may be said for and against the 'American bridge,' as it is often termed, regarding pure theory, nothing will explain away the fact that it is unequaled for facility of transport and speed of erection. That the type has reached its furthest development is open to much question, and altered conditions in this country may yet change it somewhat, but its peculiar adaptation for Colonial work will always make it a strong favorite where it can be employed." The moral of the text is that in England large firms of engineers must have a freer hand, and they will then prove themselves capable of undertaking on their own responsibility engineering enterprises of the first magnitude. In short, the British manufacturer is tired of the consulting engineer.

Coming more closely to the details, Gilbert Little asserts that it is only in the manufacture of crude iron that British practice lags behind. Referring particularly to the Midland districts, he insists upon four defects: 1, Obsolete methods of handling the raw materials; 2, an entire absence of labor saving machinery to deal with the pig iron as it runs from the furnaces; 3, the non-adoption of methods to convert the waste gases into useful and valuable products, and 4, ornamental directors. As for 1 and 2, American superiority is conceded without reservation. In regard to 3 the loss in the non-adoption of waste gases is confined strictly to the Midlands, and in regard to No. 4, ornamental directors, this is described as a scandal and dead weight on British trade. For the rest, Gilbert Little scouts with scant ceremony the claim generally made that American mechanical engineers are much more prolific inventors and far more resourceful designers of machinery than the longer experienced and much more highly educated British mechanical engineers. A second claim—namely, that American manufacturers have at their command locally automatic appliances not obtainable by British manufacturers—meets with the same stern judgment. One is led to infer that much success has been attained by American engineers mainly by the very advertisements which have accrued from the favorable judgments which have appeared in this country by uninformed critics upon American methods and practice.

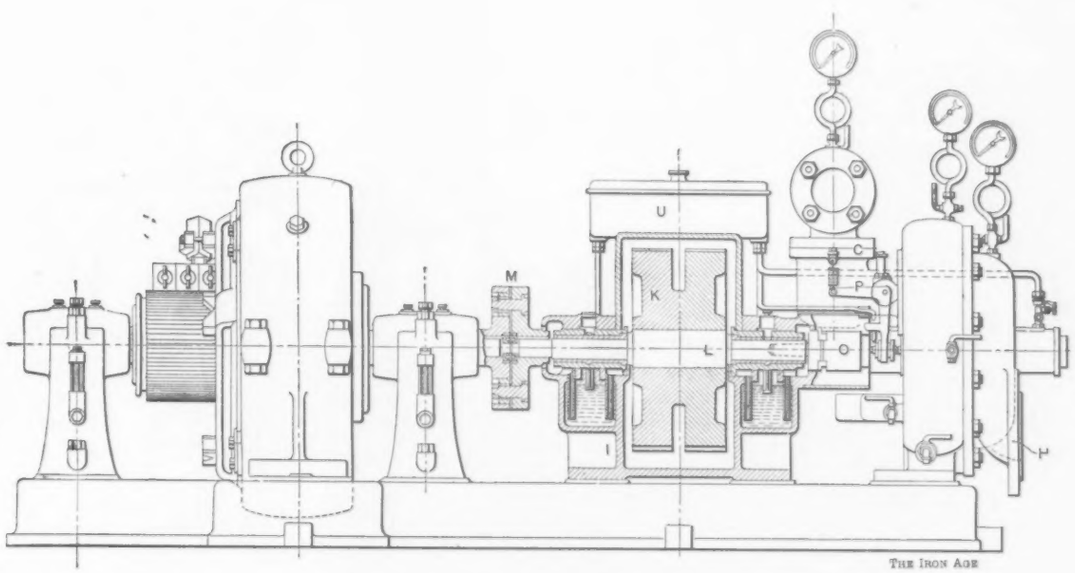



*Fig. 4.—Sectional Elevation of Fig. 3.*

THE DE LAVAL STEAM TURBINE.

**The Cramp Steel Company.**—The old Premier steel plant, at Indianapolis, Ind., with the exception of the beam mill, is to be dismantled, and the machinery will be shipped to Collingwood, Ontario, Canada, to be utilized in the works of the new Cramp Steel Company.

The Premier plant, except the beam mill, has for the past two years been owned by the Central Steel Company, largely composed of Pittsburgh capitalists, with Major Collins of Brazil, Ind., as president. For a long time it was one of the most important industries in Indianapolis, but for the past 20 years the works have been operated only for short periods, and almost invariably at a loss to the owners or lessees. The beam mill is owned by the Indiana Steel Company, whose stockholders comprise a number of Chicago people. This mill has also not been in operation for some years, and it is not yet known what disposition will be made of this part of the works.

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**The Wais-King Tool Company.**—Since October last the Wais-King Tool Company of Cincinnati, Ohio, have been busily occupied in the erection of their new shops on Clifton avenue, adjoining the Baltimore & Ohio and Big Four railroads, and expect to be ready to fill orders by the 20th. The plant is located on 3½ acres of ground, upon which has been erected a main building, 160 x 80 feet, and boiler house and engine room, all of brick. Of this building 80 x 30 feet is two stories high, the first floor of which will be occupied by pattern making department and the second floor by a storeroom for small supplies, a drafting room and business offices. The remainder of the structure will be used for the construction and erection of the company's product, boring machines, mills, punches, shears, &c. The principal of these machines is the new type of man and hand hole boiler boring and turning mill, embodying many valuable features. Power is applied by an 80 horse-power engine and 50 horse-power boiler, while a 225 light dynamo will furnish the illumination. The shop proper is equipped with the latest machine tools, traveling cranes, and supplied with an abundance of light from all sides. Switches from the railroads referred to furnish ample shipping facilities. The company will commence operations, employing about 100 hands. C. Wais, who was for many years at the head of the Wais & Roos Punch & Shear Company, will be the active manager of the mechanical department of the business, while Rufus King, Jr., will assume the responsibilities of the office management.

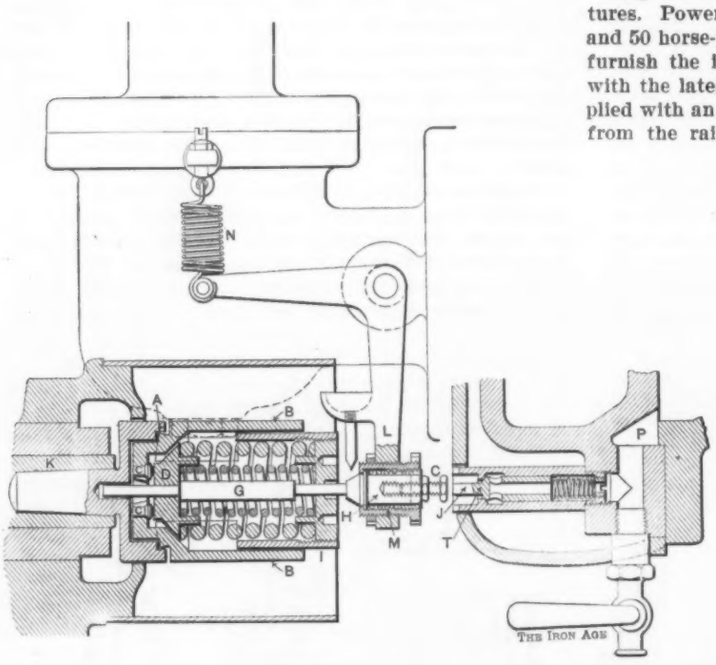


*Fig. 5.—Governor and Vacuum Valve.*

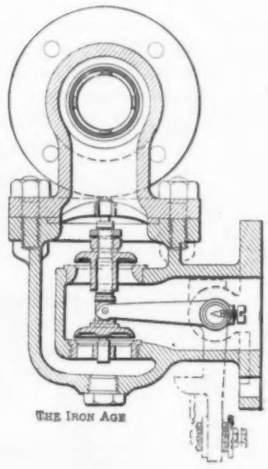


*Fig. 6.—Governor Valve.*

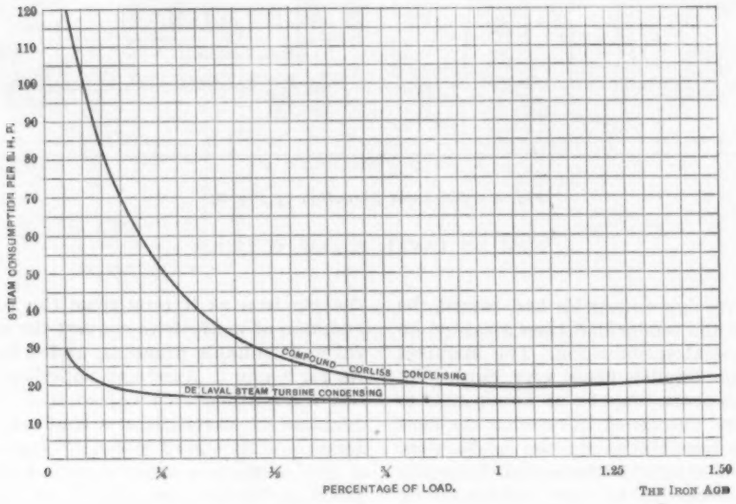


*Fig. 7.—Comparison of Efficiency at Various Loads.*

## THE DE LAVAL STEAM TURBINE.

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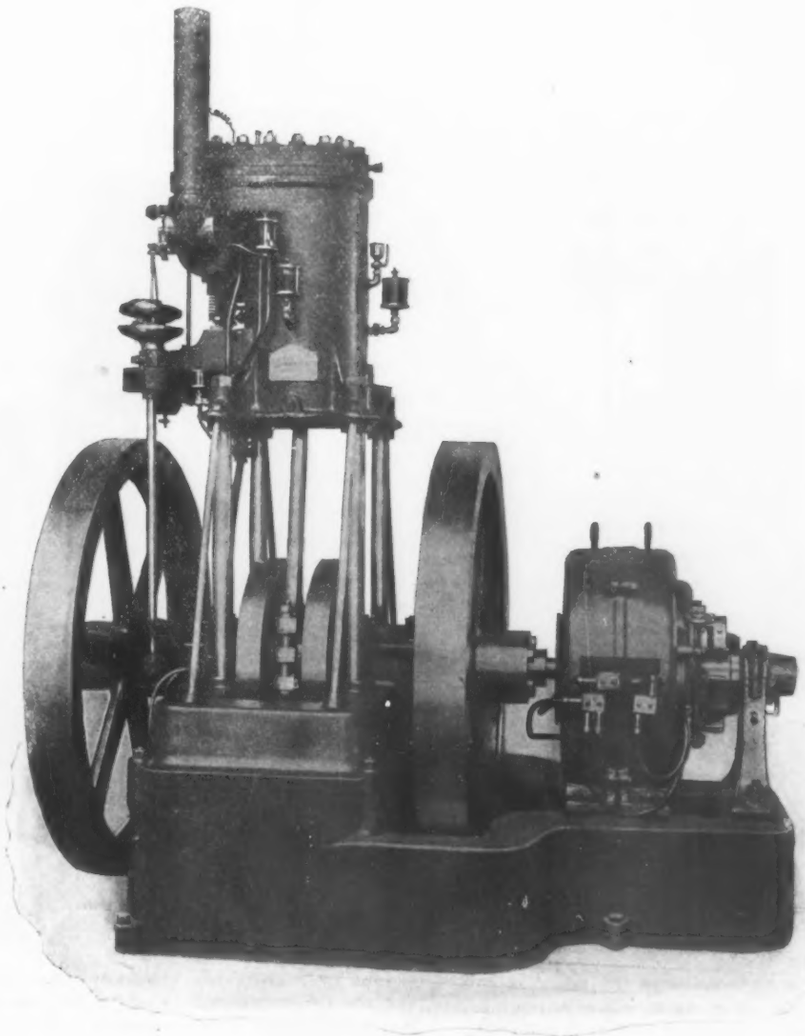
From a consular report it appears that in 1900 there were built in England, inclusive of the colonies, 698 ships, with at total tonnage of 1,471,475 tons. The United States followed next, with 197 ships and a tonnage of 297,931 tons. Germany is the next in line, with 90 ships and 211,850 tons. France follows, with 65 ships and 101,318 tons, and Italy, with 37 ships and 54,382 tons.

## The Improved Secor Oil Engine.

To generate power direct from fuel in an engine which needs no boiler is a problem which has baffled the ablest engineers for more than a century. For nearly twice that time that form of heat engine in which the fuel is burned within the engine, and its energy turned directly into work done, has been recognized as the most efficient prime mover yet devised. Its thermal efficiency has always been greater than that of the steam engine. It also has the practical advantages of labor saving, space saving and weight saving, and it will unquestionably assume the lead among power generators whenever its limitations are removed.



*Fifteen-Kilowatt Generating Plant.*

THE IMPROVED SECOR OIL ENGINE.

A century ago the steam engine offered fewer insurmountable obstacles to engineers than the gas engine, chiefly because there was neither gas nor fuel oils with which to run engines. Consequently, the steam engine was developed first and gained considerable headway.

Having in mind the restricted application of internally fired engines, John A. Secor began a series of exhaustive experiments with liquid fuel. These researches, extending over a period of several years, covered not only the thermodynamics, mechanism and performance of the internal combustion engine, but also its thermo-chemistry and the commercial availability and value of all obtainable fuels. Their object was to embody such improvements in the mechanism and operation of the internal combustion engine as would place it fully abreast of the steam engine from the commercial point of view, while dispensing with a boiler. Their result has been the development of the Secor system of generating power.

Natural gas is restricted to a few hundred square miles of the earth's surface. Illuminating gas is variable in quality, expensive, and obtainable only in small districts local to large centers of population. The volatile hydrocarbon oils, including gasoline, are daily becoming more expensive. They are not to be had in the tropics at all and are very expensive in some parts of this country and Europe. Ordinary kerosene oil, or refined coal oil, as it is called in England, is a universal fuel. While its price varies in different localities, it is always cheap compared with other fuels, and can be bought wherever civilized man has carried machinery. It is so safe that it may be used anywhere with impunity. Mr. Secor has designed an internal combustion engine which will use any of the ordinary gaseous fuels or gasolines, but which is particularly adapted to kerosene oil.

Two types of these engines are now manufactured by the General Power Company of 100 William street, New York—the Standard and the Junior. The former includes all sizes above 20 horse-power and the latter those from 2½ to 15 horse-power. The Standard type, shown in illustrations Figs. 1 and 2, combines the single cylinder with the open, steel frame construction so highly approved in marine steam engine building.

The difficulty experienced by makers of internal combustion engines in securing a system of governing which

will give uniform and steady operation has required them to use two or more cylinders and a spring connection between the engine and dynamo to secure steady current from electric generating units. No argument is needed in favor of the simplicity and reliability insured by a single cylinder and rigid connection.

The Secor engine has no more parts than a first-class steam engine of the same size. The best steam engine practice has been followed in designing it, and it should be as durable as steam engines. All parts are amply strong and of the material best suited to the function they have to fill. The engine is carefully balanced and operates without vibration. The open frame construction makes it possible for the operator to always see the condition of every part of the engine. The trunk piston is so well packed and lubricated that it is not necessary to inclose the crank case, as there are no objectionable fumes nor products of combustion to be hidden. In this engine the usual "hit and miss" principle of governing is abandoned, and the speed is controlled by throttling the inlets, as in a steam engine.

The system includes a positive method of governing, entirely automatic in operation. Each charge of oil a air is measured micrometrically by the governor, thereby insuring a charge of uniform constitution and homogeneous mixture. The fuel is drawn by a small pump from a storage tank, set at any convenient place near and below the engine, and feeds into a little oil cup supported on the outside of the cylinder casting. The automatic oil feed throttling valve draws its supply from this little cup, and the surplus flows back to the storage tank. There is never more than a pint of oil about the engine when it is running, and when it stops all of that, except enough to start the engine again, is automatically drained off. The aim of the automatic features of the oil and air feeding mechanism is to create positive starting conditions, which prohibit flooding the cylinder when starting up, and together with equally positive, but altogether different, operating conditions, at once eliminate all preheating of fuel or air, remove the necessity of a pressure feed and require neither carburetor nor vaporizer.

These operative methods furnish automatically easy and positive starting conditions which automatically change to positive and reliable operating conditions, which, when the engine is stopped, again automatically change to safe and positive standby conditions.

Not only do the operative methods of this system insure the control which makes the engine run with the greatest regularity, but they also insure complete combustion of all fuel oil and immunity from carbon deposits in cylinder and combustion chamber, so common in oil engines.

The electric ignition apparatus has been developed with the same care as other parts and contributes its share toward the reliability of the engine.

The illustration, Fig. 1, is from a photograph of a generating unit now lighting the Preparatory School of Dickinson College, at Carlisle, Pa. It consists of a 25 horse-power engine rigidly coupled to a 15-kw. direct current generator. It is started by compressed air, draws its fuel from an underground tank, and furnishes current of remarkably steady voltage, irrespective of load conditions. Fig. 2 shows a 20 horse-power engine direct coupled to a Worthington 5 x 7 x 3 triplex differential plunger power pump. The Junior type engines are illustrated in Fig. 3, of a 25-light oil electric generating plant, consisting of a 2½ horse-power engine rigidly coupled to a 1½-kw. dynamo. A band wheel is provided for power work, such as pumping. The kerosene oil supply is carried in a tank in the base. While it is expected that the larger engines will have intelligent operators, and consequently all parts are made as accessible as possible, the Junior engines are intended to be run by unmechanical attendants, such as coachmen and janitors. They are, therefore, built with inclosed crank cases; all lubrication is made automatic; adjustments are done away with, and, while all the advantages of the system are retained, these small engines are so simple, and so nearly "fool proof," that any man of ordinary intelligence can operate them successfully. Connected to dynamos they deliver current of perfectly steady voltage. They are suited to stores, country hotels, large private houses and yachts. Compactness, light weight, freedom from vibration and reliability of operation are among their characteristics.

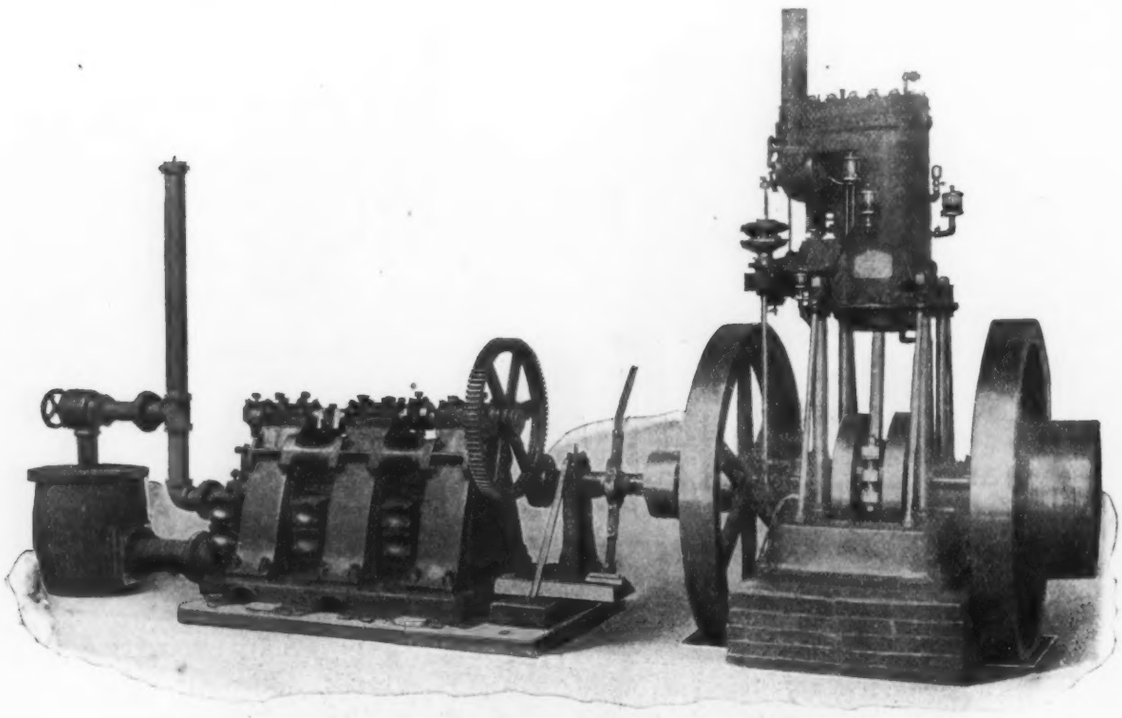


*Fig. 2.—Direct Connected 25 Horse-power Pumping Plant.*

THE IMPROVED SECOR OIL ENGINE.

## American Coal in Germany.

The following report has just been received from Frank H. Mason, Consul General at Berlin, the best informed officer in the consular service:

Toward the end of September last three prominent coal merchants, one from Hamburg and two from Berlin, went to the United States to examine systematically the conditions of coal supply and transportation, and, if practicable, to make contracts for a supply of certain qualities for the German market. Of the two Berliners, one is still in America, seeking to organize an international company for the export of both anthracite and bituminous coals to various European ports, especially to those in the Mediterranean, where it is believed that American soft coals for steaming and manufacturing purposes have a secure and promising future.

The other merchant from Berlin, who is well known here as the principal local importer of anthracite coals, has returned and given for publication a highly interesting statement of his experiences in the United States and his estimate of the general situation as it relates to the importation of American coals into Germany. Under present conditions of marine freight and local demand and supply he sees no immediate probability of any large import of American bituminous coal into this country. The only qualities which can now be obtained at the American seaboard in large quantities and at prices sufficiently low to justify their export are, says Mr. Schulze, so soft and friable that they crumble and crush in transit to such an extent that they are, when landed, inferior in grade and caloric value to Westphalian coals of a corresponding cost. American channel and Western Pennsylvania block coals are, in his opinion, of high quality and admirably adapted to the German market, but they are so scarce and expensive at home that he saw no opportunity to do business with them. At the present low rates of freight some cheap and inferior grades of American soft coal have been experimentally imported to Hamburg for as low a figure as 15½ shillings ($3.77) per ton, at which price, says Mr. Schulze, Westphalian coals of a better grade are able to compete, and he thereupon hastens to reassure the German coal producing syndicates that their fears of a deluge of steam and factory coals from the United States are for the present groundless.

Totally different, in his opinion, is the situation with regard to anthracite, the imported supply of which for Germany has hitherto been derived wholly from Great Britain. But the continued strikes and numerous miners' holidays in the Welsh coal districts, the present export duty, and frequent interruptions and delays in delivery have made German importers ready and eager to obtain a new source of supply. Mr. Schulze reports that he visited the anthracite mines of Pennsylvania and was amazed at the thickness of the veins, the ease and cheapness with which it is mined, the unlimited supply, and the effectiveness of the machinery and methods employed for breaking, screening, washing and grading hard coal for various uses. As a proof of his confidence in the future of this trade, he has purchased 10,000 tons of American anthracite for immediate importation into Berlin, 30,000 tons for delivery in March and April, and expects to import on his own account not less than 100,000 tons during the course of next year. Norway and Sweden, Denmark, Holland and even London will, in the opinion of this expert, gradually turn more and more to the United States as the source of their main supplies of anthracite. The future dimensions of the trade will depend wholly upon the disposition of American hard coal operators to foster and develop it.

Here, as in the United States, anthracite coal for domestic consumption is a luxury, the use of which is confined mainly to the well to do classes. The grates and stoves in which it is burned differ materially from those most used in our country, so that it will probably be found advantageous to export hard coal in lumps as it

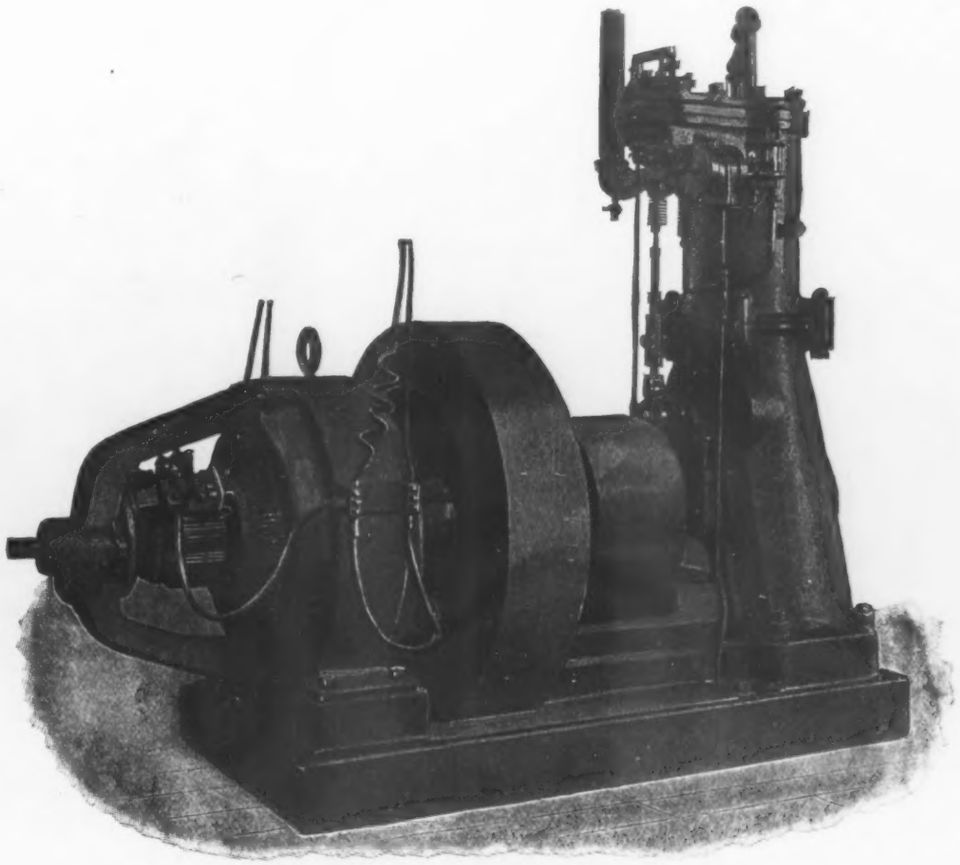


*Fig. 3.—Direct Connected 25-Light Generating Plant.*

THE IMPROVED SECOR OIL ENGINE.

comes from the mine, to be broken, screened and graded on this side into the sizes required by European markets. It is also stated that anthracite coal intended for household consumption in Germany should not be washed.

Whether or not the views of this merchant concerning the availability of American soft coal for German consumption are well founded and conclusive, opinions here differ. The paramount fact in the public mind is that notwithstanding the continued protests and present distress of many German industries, their narrowing output and enforced discharge of workmen, the German coal syndicates have persisted in maintaining practically the same prices which they received for coal during the flush activity of 1899 and 1900. One can hardly take up a Berlin newspaper without finding a report of some meeting of manufacturers or other class of fuel consumers to protest against the artificially maintained prices of coal and coke. Silesian coal of ordinary quality now retails at Berlin coal yards for 1.60 marks per centner, delivered, which is equal to $7.61 per metric ton of 2204 pounds. Ordinary Silesian steam coal costs in carload lots 24.40 marks ($5.80) per ton, delivered in this city. As the river freight on coal from Hamburg to Berlin is about 3 marks (72 cents) per ton, it would seem that if American or other foreign soft coal can be landed at Hamburg for any price approaching 16 marks ($3.80) per ton, there ought to be a chance for it in the retail market of the German capital.

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The first heat of steel at the plant of the Dominion Iron & Steel Company was poured on December 31.

## A Novel Adaptation of the Shaper and Shaper Vise.

An interesting shaper performance was recently accomplished at the works of Gould & Eberhardt, Newark, N. J. The work was interesting not only from a mechanical standpoint, but also owing to the circumstances under which it was performed.

About three days before the Holland submarine torpedo boat "Fulton," was officially tested at Greenport, L. I., the machinery of the little craft was disabled by the breaking of a steel pinion. A new forging was made immediately, and in 24 hours a blank was turned and bored. By noon of the next day the blank reached the works of Gould & Eberhardt. In less than 24 hours the new pinion was completed, and on the day following the successful test was made, the boat remaining under water for 15 hours.

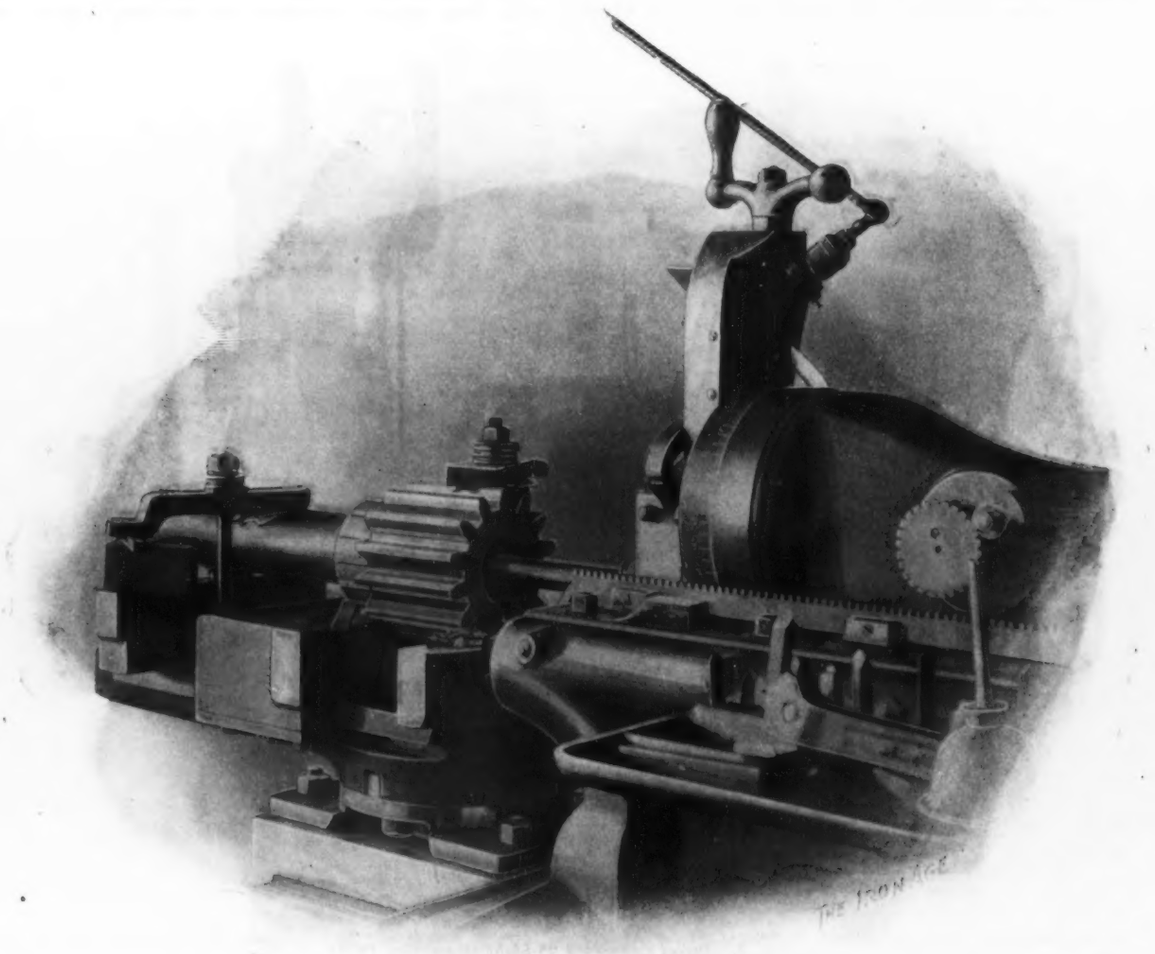

*Fig. 1.—Showing Method of Cutting Keyway.*

A NOVEL ADAPTATION OF THE SHAPER AND SHAPER VISE.

Had it simply been an ordinary steel pinion this would only be considered a quick job. The pinion, however, was not of the ordinary variety. It was on the end of a short hollow shaft, the bore of which was only 1⅛ inches, while the hole in the pinion was 2¾ inches in diameter. It was necessary to cut a keyway in the latter. It was originally intended to chip this out by hand. This tiresome process was, however, avoided. The pinion was placed in the vise of a 24-inch shaper. A piece of shafting was selected to serve as a cutter bar. This was 1⅛ inches in diameter, fitting in the hole in the hollow shaft end of the work. The other end of the cutter bar was tapered to fit in a taper hole in a set of

bushings, which were placed in the regular apron of the head in substitution of the tool post. A piece of Mushet

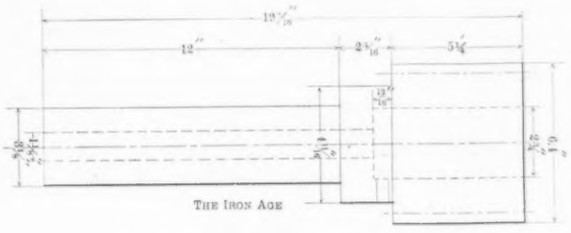


*Fig. 2.—Longitudinal View of Pinion.*

steel was inserted in the center of the bar and fastened by means of a set screw.

It was necessary to cut the keyway as close as possible to the collar at the end of the pinion. A small hole was drilled through this collar to furnish clearance for the tool. So as to prevent the lifting of the apron upon the drawing back of the ram, a jib screw was inserted through the side of the box. The stroke of the ram was properly adjusted, and the work proceeded. The depth of the feed was increased by simply tapping the tool slightly as it was withdrawn from the work.

Besides clamping the pinion in the vise in the usual manner, it was fastened in an interesting manner, which is made possible by the construction of the Eberhardt vise. The vise has T-slots running in the center of the ways which permit the bolting of work onto the ways direct.

This feature is more clearly illustrated in Fig. 3. In this engraving a regular piece of shaper work is shown. Clamping it to the ways of the vise obviated the usual procedure of removing the vise and substituting a face plate for holding work that cannot be held in the jaws of the vise.

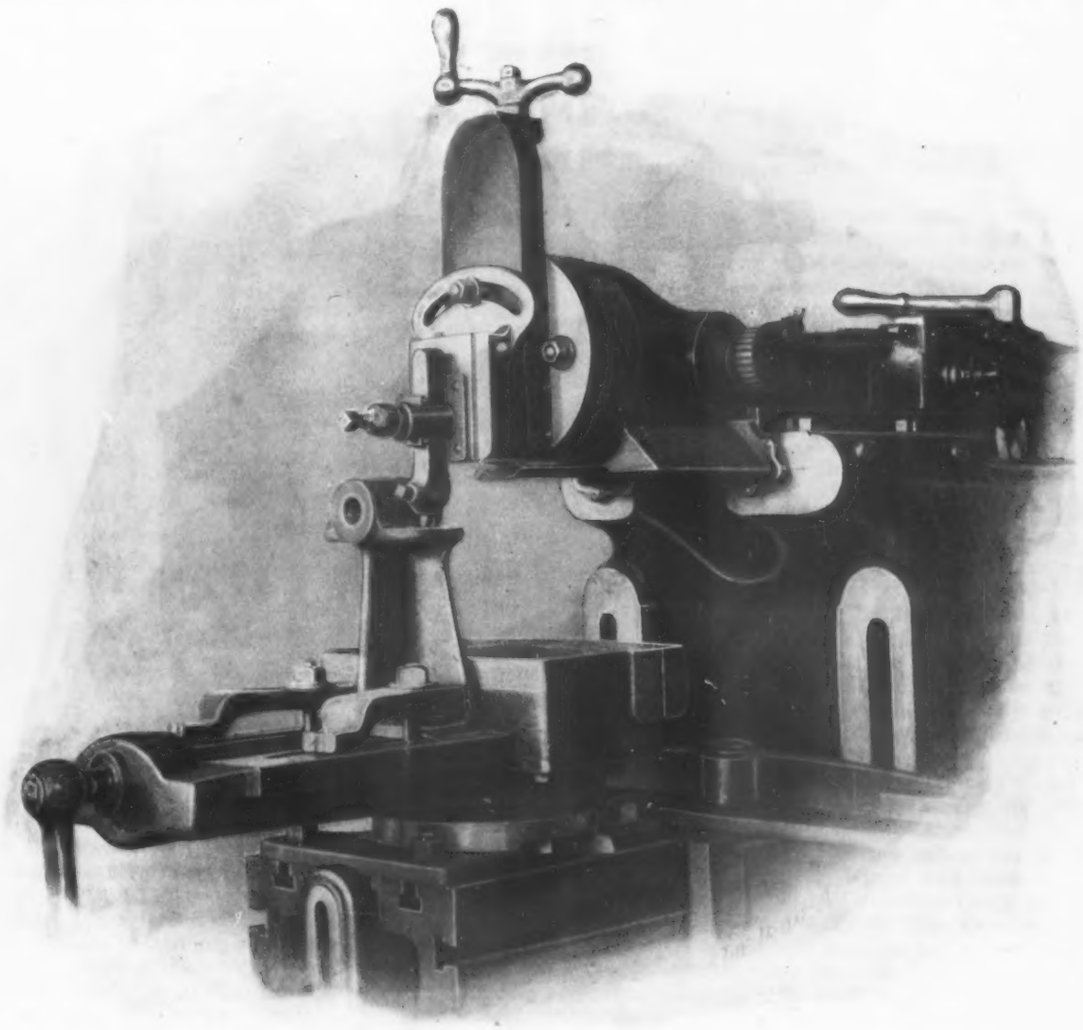

*Fig. 3.—Method of Bolting Work Direct to Ways of Vise.*

A NOVEL ADAPTATION OF THE SHAPER AND SHAPER VISE.

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William A. Bancroft, president of the Boston Elevated Railway Company, reports that during the last fiscal year the company increased their motive power by putting into service two new engines of large size, each of 4050 horse-power, operating a 2700-kw. generator, at the Lincoln power station. Provision has been made for two other engines and generators of corresponding size, one at the Lincoln power station and one at the Charlestown power station. When these are installed, the company will have a motive power of 55,316 horse-power, or 36,944 kw., at normal capacity, capable of sustaining an overload of 15 per cent. for hours in addition, so that under stress the generators ought to supply power to the amount of 63,612 horse-power, or 42,486 kw.

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It is announced that the management of the Louisiana Purchase Exposition have decided to offer a prize of $200,000 for the successful operation of a dirigible air ship at the World's Fair of 1903. Professor Langley, M. Santos-Dumont and Sir Hiram Maxim are expected to take part in the aerial tournament.

## The Northern Electric Motors.

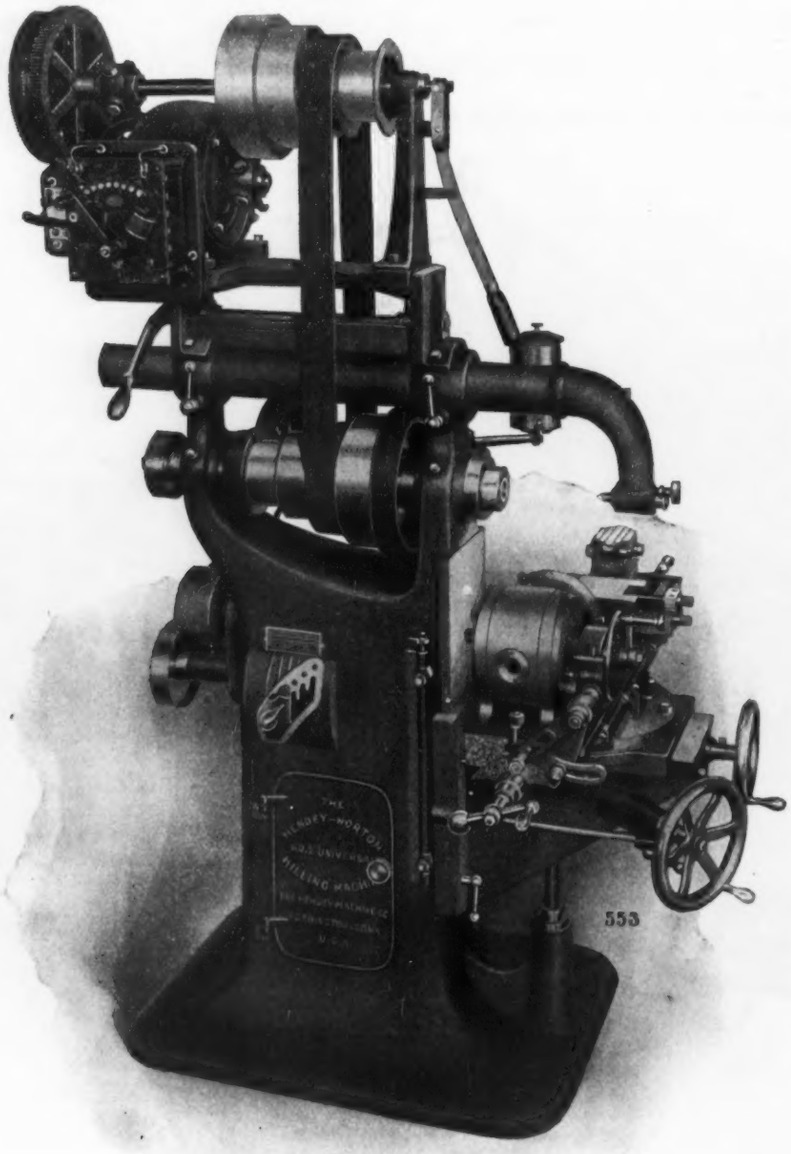
The field frames of the spherical generators and motors constructed by the Northern Electrical Mfg. Company of Madison, Wis., are cast from a fine grade of soft steel having a very high magnetic permeability. They are without joint of any kind, thereby insuring a perfect magnetic circuit. The field coils are accurately formed of insulated copper wire wound evenly and compactly by automatic machinery. Insulation of the coils as well as protection from mechanical injury, has been so well guarded that they are claimed to be practically impervious to water or oil.

The armatures are of the usual iron clad type, the core being built up of thin annealed soft steel disks, correctly punched and notched for the reception of the bars or coils. Each disk is insulated on both sides, and assembled on a spider, which is designed to facilitate a free and abundant circulation of air. The core is put under great pressure, bringing the disks into a solid, compact mass, yet perfectly laminated.

Particular attention is paid to the insulation between the segments of the commutators. Nothing but the best mica is depended upon for this important work. The segments are forged from pure copper, uniform in density and having the grain or flow in the direction of length, so as to secure a smooth, durable surface.

The coils are form-wound of wire or bar copper, according to the size of the machine. Each coil is made from a single length of copper and is inclosed in an insulating cell. The slots of the armature core are lined with a layer of insulating material before the bars are laid in place so that there is no chance of a "ground" or fault developing at this point.

The bearings are either of bronze or babbitt metal, according to the size of the machine. The arrangement is such that in no event is it possible for the armature to drop against the pole pieces and become damaged. Each bearing is spherically seated, making it self adjusting and self aligning.




NORTHERN ELECTRIC MOTOR DRIVING HENDEY-NORTON MILLING MACHINE.

In the first engraving one of these motors is shown applied to a Hendey-Morton milling machine. It will be noticed that the motor is of the back geared type. Carried on the end of the armature shaft are two rawhide pinions of different diameters, driving two large gears on the countershaft, the gearing being properly proportioned to give the required driving speeds to the countershaft. These large gears run smoothly on the shaft. Their inner formation is that of friction clutch pulleys and carried between, keyed to but sliding on the shaft,

is a friction clutch which is thrown into connection with either gear, as desired. This affords all desirable speeds for the spindle. This arrangement permits of the motor being run at a constant speed, maintaining at all times its maximum horse-power, which cannot be had when the speed of the motor must be varied to accommodate the needs of the spindle speeds.

The second engraving shows one of these motors driving a rattler. Interposed between the motor and the barrel is a train of gears for reducing the speed. The dust proof qualities claimed for this motor render it peculiarly applicable to work of this character.

## Central Pennsylvania News.

HARRISBURG, PA., January 6, 1902.—Interviews with the heads of the iron and steel establishments in this city show that there is a very hopeful feeling regarding 1902, and that a number of extensions may be made to works in and about Harrisburg.

James B. Bailey, general manager of the Central Iron & Steel Company, said that in 1901 the Central's mills had made more plates than in any year of their existence, and that prospects favored long running in

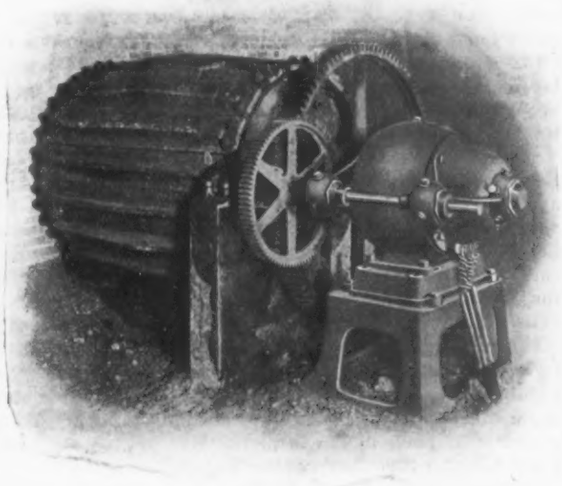


*Fig. 2.*

NORTHERN ELECTRIC MOTOR DRIVING RATTLER.

1902. The same was said concerning the puddle mill of the Chesapeake Nail Works, whose cut nail department had also been fairly busy.

President W. R. Fleming of the Harrisburg Foundry & Machine Works reports that the works had handled a large amount of business and had found it necessary to build an addition 150 x 50 feet. J. P. Luce, manager of the tin plate mills of the Lalance & Grosjean Company, said that the year had been the most satisfactory since the works were established, while President R. C. Neal of the Harrisburg Rolling Mill Company remarked that the year had been a prosperous one, and that a number of additional puddling furnaces had been built. S. F. Dunkel of the Harrisburg Mfg. & Boiler Company observed that the year had witnessed expansion of the concern's business, especially in pipe for export, and D. E. Tracy of the Harrisburg Pipe & Pipe Bending Company reports that his company intend to make some enlargements after a very good year in all departments. The Pennsylvania Steel Company will continue their extensions along their already announced lines.

At Harrisburg all works are in operation, and the works report plenty of orders, the Central having a contract with the Navy Department. Other works have received good orders and foundries and machine shops are running overtime.

Lebanon was harder hit than this city by the car shortage, and the new year found some of its works and furnaces closed by reason of the lack of fuel. The Lebanon, Colebrook and Cornwall furnaces lost some days, but are now in blast. Robesonia Furnace was also compelled to stop for several days because of the fuel and the Reading district was similarly affected. J. & R. Melly's furnace, at Lebanon, will be blown in this month after repairs.

A stove factory is to be established at New Berlin.

The works of the Altoona Foundry & Machine Company at Altoona are being rushed to completion and may be started in March.

Among the notable orders placed in this section lately was one for the Pennsylvania Steel Company, in which the Bangor & Aroostook Railroad Company contracted for the metal needed in the construction of 50 miles of railroad in Maine. There will be rails, bridges, tie plates, switches, signals and other necessary material furnished by the company, all of which will be made at the works at Steelton.

The Lukens Iron & Steel Company have started up their puddle mills at Coatesville, after having made a number of improvements in their machinery.

M. H. Treadwell & Co. have taken charge of the Lebanon Mfg. Company's works at Lebanon, and there will be steady operation after some changes. The company will be known as the M. H. Treadwell Company of Pennsylvania.

York iron and steel industries, especially those engaged in the agricultural implement manufacturing lines, began the year with excellent prospects. All of the works have many orders and the shipments for 1901 were about the largest ever made, there being a great gain in export business, while growth was noticed in the trade with the Southwest. S.

## The Frick Building in Pittsburgh.

Preparations are being made by a large number of manufacturing interests in Pittsburgh to move into the new Frick Building, in that city, which is fast nearing completion, and is expected to be ready for tenants by March 15 next. The Pittsburgh Plate Glass Company, now in the Carnegie Building, will occupy the third floor of the Frick Building. The National Tube Company, whose general offices are in the Conestoga Building, and sales offices in the Empire Building, will combine all their offices on one of the upper floors in the Frick Building. It is intended that all of the constituent companies of the United States Steel Corporation, which are now located in the Carnegie Building, will occupy quarters in the Frick Building. These include the American Steel & Wire Company, who are now located in the Tradesmen's Building; the American Sheet Steel Company, whose offices are in the Vandergrift and Empire buildings, and some of the general offices of the American Tin Plate Company, now located in the Carnegie Building. The Crucible Steel Company of America, whose offices are in the Empire Building, will also move into the Frick Building, occupying a whole floor. It is understood that Henry C. Frick assumed the lease of the Crucible Steel Company of America, in the Empire Building, which has two years to run from April 1. The Union Steel Company, also in the Empire Building, will move into the Frick Building. It will be noted that this new structure, which is said to be the finest office building in this country, will contain the offices of most of the leading iron and steel interests in the Pittsburgh district. Goff, Horner & Co., iron and steel factors, in the Lewis block, will also move to the Frick Building. One of the latest features to be added to the Frick Building is the establishment of a restaurant in the basement, as well as on the top floor. This will allow tenants on the lower floors to dine in the basement restaurant without journeying to the top floor. It is also stated that a manufacturers' club will occupy quarters in the new structure. It will be a business association, have social features, and will provide a gathering place for the leading officials of the various large iron, steel and glass concerns in Pittsburgh.

## Lake Iron Ore Matters.

DULUTH, MINN., January 5, 1902.—A very important sale of iron ore properties is under consideration in this city, the land being a tract upon the west end of the Mesaba range, in section 32, T 57 R 22, where explorations have been under way for a year past. There are in the deposit between 25,000,000 and 30,000,000 tons of ore running above 55 per cent. iron, as well as a large quantity between that standard and 50 per cent. Some is Bessemer and some high phosphorus. The ore is mixed and does not run evenly, but the tonnage is so large that the price put on the lease is not far from $900,000. The lease is owned by Messrs. Kinney, Hawkins, Pearce and Crosby of Duluth, and the fee is in the possession of the Mississippi River Lumber Company, in which the Weyerhaeusers and others are interested. The sale will cover but 160 acres, while the lands under lease to the same exploring syndicate embrace much more. Another sale, of 120 acres in 12, T 57 R 21, has been under consideration to the same buying interest, but a portion of this land is mixed up in a conflict of ownership between the State of Minnesota and the Duluth & Iron Range Railway (United States Steel), and there may be delay. On this latter there have been shown several million tons of ore, with the probability that much more will be found there as work progresses. In the case of both these properties the probable buyer is not a mining but a transportation interest, seeking the lands for the railway traffic therein.

What appears to be a valuable find of manganiferous iron ore is being made on the eastern end of the Gogebic range, or upon a formation similar and parallel to the Gogebic, though south of the general eastern extension of that district. The discovery is 28 miles from Sunday Lake, in a southeasterly direction, and is not far from Lake Gogebic. Shaft sinking has opened into a body of ore which has been crosscut 50 feet, still in the ore. Combined iron and manganese average about 59 per cent. the latter running from a trace to as high as 17 per cent. Some machinery will be put in at once and explorations by the present parties will be continued steadily until the value of the find is known.

E. F. Bradt, who has been working on the Menominee range and near Republic for months for a concern generally unknown, has now been appointed mining superintendent of the Algoma Commercial Company (Clergue syndicate), his territory including the Michipicoton range, the Sudbury region and the Michigan ranges. The work at the Helen mine will be pushed by the company themselves, instead of by contract, as in the past, and a better showing is looked for than has been made. The work in the Sudbury region, where the syndicate has several nickel and pyrrotite mines opening, is expected to develop greatly, and explorations will be continued in the Michigan district, where Mr. Bradt's previous work was for the same concern. A contract for considerable diamond drill work on the Michipicoton range has been let to Cole & McDonald Exploration Company of Duluth, and the new properties there, the Josephine and others, will be thoroughly examined. Captain Buzzo of the Menominee will have direct charge of the Helen, and radical changes in methods will be made there, previous contract plans having been exceedingly unsatisfactory. Mr. Bradt expresses the opinion that the Josephine will be a great mine.

At the Republic mine, Marquette range, they are installing a large ore crusher. At No. 9 shaft they are opening a level at the depth of 1250 feet, the deepest place about the mine. A little ore is being hauled all rail from the Lake Angeline mine to the Pittsburgh furnaces of Jones & Laughlins, though probably not on account of any especial demand for the ore. This concern, in their Mesaba explorations, have found large ore bodies, and at their Lincoln, now being opened, they have a good depth of Bessemer ore clear across one 40 and into those on either side, with the ore 750 feet wide. They think they have at least 30,000,000 tons in sight on that range.

There is considerable activity at various points on the Menominee range. At the Bristol, where an excellent new find was made late last summer, there is much new work, and the future of the mine seems to be assured. About 125 men are at work now. The Hiawatha, which has been moving along slowly, is increasing its force to about 100 men, and expects to mine about 75,000 tons this year. At the Columbia ore is coming up at an unusually rapid rate and the mine is said to be looking better than for a long time. At the James exploration they are working along as fast as possible with exceedingly favorable indications.

Since the new year the Chicago, Milwaukee & St. Paul road has put on a large force in dock construction, and will push the extension of its ore dock at once. The capacity of the dock built a year ago will be doubled, by an extension of 726 feet, being 120 pockets of about 23,000 gross tons storage capacity.

The Cleveland Cliffs Iron Company are preparing to blow in their Carp furnace, at Marquette, after a shut down for rebuilding. Under former conditions the furnace was making about 40 tons of iron daily, but it will be good for about 65 tons when ready again. Work on the large furnace by the same company has been hindered by the cold weather, but it is still hoped to have it running the present year.

From the report of the State Labor Bureau of Minnesota, having something to do with labor at mines, it is shown that the wages of men employed at mines in the State have increased from an average of $1.65 to $2.20 since 1896; that contract miners earned an average of $2.52 a day in 1901; that the improvement in wages between 1899 and 1900 was 20 cents, and that the number of men employed in mines was in 1898 4400 in 1901 8500.

The mining end of the United States Steel Corporation is working out some important changes in management of operations. It is probable that there will be shortly but two operating companies in the Minnesota fields, the Oliver Iron Mining Company and the Minnesota Iron Company. On the Michigan ranges the great majority of the work of mining will be by the Oliver Iron Mining Company, and there will be little by any other sub-corporation, excepting where outside interests have a holding in some particular property. The great number of corporations under which the Minnesota and some other companies have worked has probably been found annoying and exasperatingly tedious by the United States Steel Corporation's operating heads.

The mining and stocking of ore is going on very rapidly and smoothly all around the upper lake region, and an enormous quantity of ore is coming up monthly. A number of new properties will be in operation the coming season, and the older and more settled districts will make, so far as can be understood at this time, about the shipment of the past year. D. E. W.

## Drawback on Stamped Steel Ceilings.

Under date of December 30, O. L. Spaulding, Assistant Secretary, has rendered the following decision:

On the exportation of stamped steel ceilings, in which term are embraced coverings for side walls as well as ceilings, and all kinds of moldings, cornices, friezes, rosettes and other decorative designs, manufactured by Henry S. Northrop of New York, wholly with the use of imported steel sheets, by the processes of trimming and stamping or embossing, to which afterward may be added a thin coating of paint, a drawback will be allowed equal in amount to the duty paid on the imported steel used, less the legal deduction of 1 per cent.

In liquidation, the weights of imported sheet steel of the several gauges which may be taken as bases for allowance of drawback may equal the net weights declared in the drawback entry, after official verification; provided that in case any of the merchandise has been painted, 6 per cent. of its net weight shall be deducted therefrom to find the actual weight of steel exported.

For the calendar year 1901 the American Car & Foundry Company built approximately 65,000 cars, of which about 500 were passenger cars.

# Canadian News.

### Rainy River Railroad.

TORONTO, January 3, 1902.—On the last day, but one, of the old year the final spike was driven in the Ontario & Rainy River section of the Canadian Northern Railroad. The completion of this important work, which opens a new rail outlet for Manitoba grain parallel to the Canadian Pacific Railway, which brings upon the market the well timbered, mineralized and fertile lands of the great Rainy River district, was made the occasion of much rejoicing. A short gap near Rainy Lake remains to be laid with rails. At Atikokan there is a substantial roundhouse and station, a hotel and store. From these as a nucleus it is confidently predicted a great mining center will spring up. Unless the development work still proceeding on the iron range there proves disappointing there will probably be a great ore shipping business entered upon in the next six months. When the season of navigation opens Manitoba grain will afford material for traffic, as there is still a great part of the crop in the hands of the growers. But wheat is not to be had all year round, and the iron ore mines, if their output is of the right kind, will have to be turned to account as a source of revenue.

At a banquet at Port Arthur, Hon. E. J. Davis referred to the material progress made by Ontario within the last year. In 1901, he said, the Province had made its largest cut of lumber and higher wages had been paid in the shanties and saw mills than ever before. In colonization, too, 1901 had been a banner year, many hundreds of families having gone into Temiscamingue, Rainy River and other sections of New Ontario. Mining showed marked progress. In Sudbury region the nickel output had been more than doubled in the last two years. Iron mining was prosperous. In 1895 no iron ore was raised in Ontario. In 1900 the yield of iron ore was 90,302 tons, and in 1901 it rose to 300,000 tons. In 1900 there were produced 62,386 tons of pig iron worth $936,000, and in 1901 fully 120,000 tons were produced, valued at $1,750,000. Since 1869 the mileage of Ontario railways has increased from 1273 to 6825 miles. He gave warm praise to Mackenzie & Mann.

Hon. Colin Campbell, Attorney-General in the Manitoba Government, replied to the toast to the Legislature of his Province. Over 70,000 people, he says, went into the West in 1901, and 100,000 more are expected by Manitoba and the Territories in 1902. Before many years he expected to see the 50,000,000 bushels which the Northwest raised for export in 1901 increased to 500,000,000 bushels.

### Algoma Tube Works.

An order was passed by the Ontario Government a few days ago incorporating the Algoma Tube Works, Limited, with an authorized capital of $30,000,000. This is another, and by far the largest, of F. H. Clergue's industrial enterprises at Sault Ste. Marie. When the plant is completed it is expected to employ some thousands of hands and to be the largest industrial concern in Canada. The provisional directors are F. H. Clergue of Sault Ste. Marie, Ont.; E. V. Douglas, W. P. Douglas, F. S. Lewis, John S. Freeman of Philadelphia, and H. C. Hamilton of Sault Ste. Marie, all of whom are connected with the boards of existing Clergue companies. Mr. Hamilton was in Toronto, in connection with the incorporation of the company. He says that work is to be begun on the tube buildings next summer. No plans have yet been prepared, nor has a site been selected, but it is probable it will be located to the west of the Clergue buildings already erected. The manufacture of tubes after the Perrin patent is contemplated, rights to make such tubes having been acquired by the Clergue syndicate. Material turned out by other Clergue industries, notably the steel plant, will be utilized in the tube works.

### Scarcity of Coke.

Foundries in Toronto and other parts of Ontario are near the end of their coke supplies. Of both soft coal and coke there is a shortage and a threatened famine, but the scarcity of coke is the chief cause of anxiety. The situation has been serious for the last two weeks. The holiday season, when foundries are usually slowed down for repairs and stock taking, was welcome this season. Several foundry companies took the opportunity to close. Lack of cars is the cause of the shortage. This autumn the railways of Canada have not been able to meet the demand upon them, either for rolling stock or power. Their traffic has been unprecedented. So far as the manufacturing portion of the country is concerned, it suffered somewhat by the withdrawal of Canadian Pacific Railway rolling stock to the Northwest for the handling of the crop there. But no matter how much railway accommodation there might be in Ontario, there would probably still be a shortage of coke, as the American roads over which that commodity has to pass for transit to Canada are themselves heavily overtasked. This autumn the quantity of soft coal delivered in Toronto was greater than ever before, and possibly quite as much coke as usual was laid down here, but Toronto's manufacturing needs are now far greater than the average of the previous five years, or than the highest requirements of any former single year. It is complained that coke and coal intended for Ontario works are diverted at Buffalo and sent to consumers at other points. So annoying has this become that one large company in Toronto had to send a man to Buffalo to look after their shipments. In some cases manufacturers have been able to borrow from their neighbors. One foundry has been closed two weeks for want of coke.

### Minor Notes.

J. E. Newsome of Port Arthur was in Toronto the other day. He brought with him some samples of high grade hematite ore which he discovered within 4 miles of Port Arthur. The extent of the deposit cannot be ascertained until the snow is off the ground.

At a representative meeting of the ratepayers of North Sydney, Cape Breton, a resolution was passed declaring it to be the sense of the meeting that a bonus of $30,000 should be granted to the Nova Scotia Steel & Coal Company for the erection of blast furnaces, and one of $20,000 for the erection of steel works whenever these should be put up, together with exemption from taxation for 20 years and the free use of water from Pottle's Creek.

Joseph Errington, manager of the Massey Station Copper Mine, was in Toronto the other day. About 50 tons of ore are being shipped daily, he says, to the Ontario Smelting Works, at Copper Cliff, which, as well as the mine, is the property of the Orford Copper Company of New Jersey.

Efforts are being made to have a branch of the Central Ontario Railway extended to an iron mine in the township of Mayo, 7 miles distant from the main line.

The McClary Mfg. Company, London, Ont., have purchased the stove works of the Copp Company, Hamilton.

The Dominion Bridge Company have decided to increase their capital to $1,000,000. C. A. C. J.

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Work is beginning on the New York, New Haven & Hartford Railroad Company's improvements of the third-rail system between Hartford and Bristol, about 19 miles. Higher voltage alternating dynamos are to be placed in the Berlin power house, heavier copper wire installed, and at Hartford, New Britain and Bristol will be placed substations with transformers. The third rail is to be improved, the outer rails rebonded, and the cars geared for higher speed. A uniform voltage for all service is to be established. A more frequent express service between Hartford and Bristol is another feature of the plan.

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The various transatlantic steamship lines, brought 567,011 passengers in the 882 trips made to New York during 1901. Of this number 128,143 were cabin and 438,868 steerage passengers. The North German Lloyd Line brought 20,403 cabin and 76,804 steerage; the Hamburg-American Line, 20,524 cabin and 63,223 steerage passengers; the White Star Line, 18,167 cabin and 30,483 steerage; the Cunard Line, 17,783 cabin and 19,943 steerage, and the American Line, 12,110 cabin and 12,511 steerage passengers.

## New Watson-Stillman Hydraulic Valves.

In their valves and fittings for high pressure hydraulic work the Watson-Stillman Company of 204 East Forty-third street, New York, have eliminated joints and connections as far as possible. The inlet and outlet passages are made to suit the desired situation without unnecessary L's or T's. In their "balanced spindle" valves the packings are fixed and the spindle is packed at both ends, which are of equal diameters. Since the spindle is seated by springs and raised by short levers it is easily controlled under high pressure.

The accompanying engravings may be said to be progressive, inasmuch as they represent valves of different types having from one to six balanced spindles. The design of all of these valves is the result of the experience gained by the company in the manufacture of hydraulic appliances. While the balanced spindle stop valve is made in large sizes, it can be easily operated and tightly seated when needed, which is not the case with movable packing valves designed for frequent motion and where a slight leakage is not material. A 6-inch valve of this type, working at 2500 pounds per square inch, can be closed with a hand wheel only 12 inches in diameter. The valve spindle is very large for the size of pipe so that the seats have very little tendency to cut with high speed water.

The two-spindle governing valve, Fig. 3, has a closeness of adjustment of speed not attainable with a single lever valve, with which it is usually desired to have the valve either closed or wide open. The spindle operating lever fulcrums on the ends of the spindles, thereby giving the releasing spindle twice the opening of the other

*Fig. 1.*

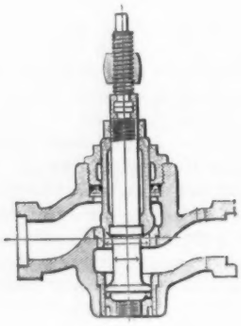

*Fig. 2.*

*Balanced Spindle Stop Valve.*

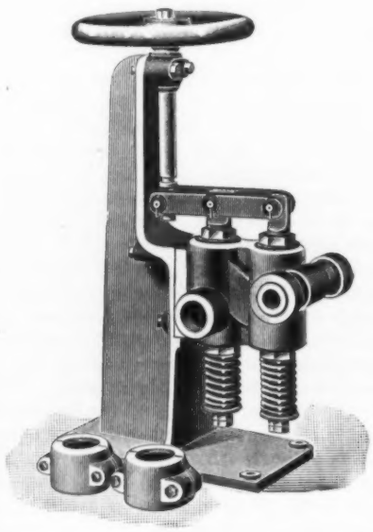

*Fig. 3.—Two-Spindle Draw Bench Valve.*

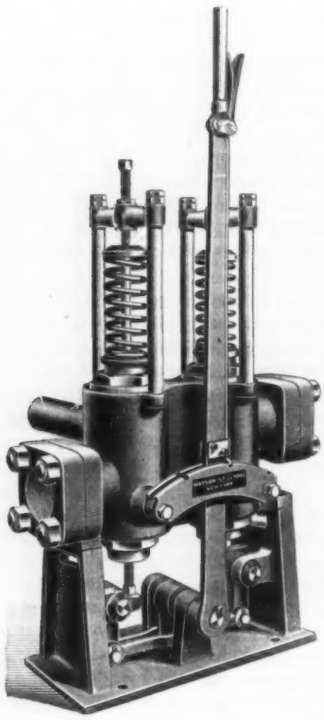

*Fig. 4.—Two-Spindle Balanced Governing Valve.*

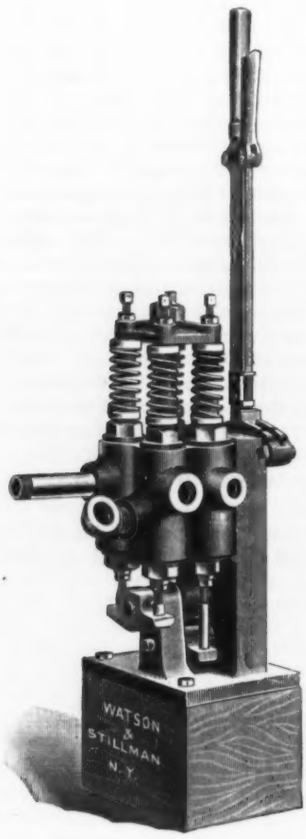


*Fig. 5.—Double Stop and Release Balanced Spindle Valve.*

NEW WATSON-STILLMAN HYDRAULIC VALVES.

with the same amount of hand motion. The hand wheel shaft has a traveling nut at its lower end journaled in the operating lever. This nut is mounted so that it travels one-half revolution before acting on the spindle levers. This is essential to prevent the accidental lifting of one of the spindles and the starting of the tool.

The governing valve, Fig. 4, has two balanced spindles which are forced alternately from the seats by a latching lever. The balancing pressures can be varied to suit the requirements by tightening the upper set screws, while loss and amount of motion can be adjusted by the screws in the end of the spindle. In order to repack or regrind a valve seat the spindle may be

*Fig. 6.—Double Three-Spindle Balanced Governing Valve.*

NEW WATSON-STILLMAN HYDRAULIC VALVES.

removed entirely by taking out the springs. The spindle centers in the size shown, which is a 3½-inch valve, are so far apart that auxiliary cam shafts are necessary, and which are connected with the lever by links. This valve was designed for use with an accumulator, one spindle letting the pressure on the press, the other releasing, and only one being open at once.

The double stop and release balanced spindle valves are employed for the operation of a tool which is driven both up and down by an accumulator, or a steam pump, and not when the ram is operated by a belt pump, or differentially with a smaller diameter always under pressure. The diagonally situated spindles are raised at the same time by the cams. When the lever is in the middle notch all the valves are closed; moved either way it directs the pressure on one side of the piston head and releases the other. This same valve is so arranged that the operating lever can be placed at a distance from the valve itself.

The last engraving represents a double three-spindle balanced governing valve, intended for operating large, double acting presses by high and low pressure accumulators. The lever is placed upon one end of a shaft which carries two double cam levers and one gear operating another double cam. In working the lever either way from the central position the central valve on the opposite side is first opened by the secondary cam, opening the release to the cylinder end opposite the desired forward motion and to the low pressure accumulator, while the last notch will open to the high pressure. Check valves are provided for preventing the high pressure accumulator delivering to the low pressure one. The valves are all balanced and rest upon springs. They are all adjustable for stroke by a screw with jam nuts in the upper end of the spindle.

## The Chicago Pneumatic Tool Company.

The organization of the Chicago Pneumatic Tool Company of New Jersey has been completed, and on December 31, 1901, took over the properties proposed—namely, the business and plants of the Chicago Pneumatic Tool Company of Illinois, the Boyer Machine Company, Detroit, Mich.; the Chisholm & Moore Mfg. Company of Cleveland, Ohio; the Franklin Air Compressor Company of Franklin, Pa., and the new Taite-Howard Pneumatic Tool Company, Limited, of London, England. The securities issued are $2,000,000 5 per cent. 20-year gold bonds, and $5,000,000 common stock, there being only one kind of stock. There remains in the treasury, unissued, $500,000 of bonds and $2,500,000 of stock. We are advised that the company start with a working capital very largely in excess of $1,000,000, of which more than 50 per cent. is in actual cash. The actual earnings by the constituent companies, before this organization, are reported to have been at the rate of $700,000 per year, which, after paying fixed charges and sinking fund under the mortgage, leaves 11 per cent. earnings on the stock. J. W. Duntley, the president of the company, is of the opinion that those earnings will be very largely increased as the result of the unification of these properties into one company, and that one of the great needs is accomplished—namely, getting sufficient capacity to supply the trade and take advantage of the large and increased business offering.

The directors of the company are as follows: Charles M. Schwab, president United States Steel Corporation; John A. Lynch, president National Bank of the Republic, Chicago; John R. McGinley, capitalist and banker, Pittsburgh; James H. Eckels, president Commercial National Bank, Chicago; William B. Dickson, assistant to president United States Steel Corporation; Charles A. Miller, president Galena Oil Company; J. W. Duntley, president Chicago Pneumatic Tool Company; Joseph Boyer, president Boyer Machine Company, Detroit; Edward Y. Moore, vice-president Chisholm & Moore Mfg. Company; Max Pam, counsel; John Charles Taite of Taite-Howard Company, London, England; Charles Parker Whitcombe of Taite-Howard Company, London, England.

The Executive Committee is as follows: J. W. Duntley, chairman; Charles M. Schwab and Max Pam.

The officers are as follows: J. W. Duntley, president; W. O. Duntley, vice-president; Edward Y. Moore, second vice-president; Ernest P. Wenger, treasurer; H. R. Kent, assistant treasurer; Leroy Beardsley, secretary; S. G. Allen, assistant secretary; Joseph Boyer, mechanical engineer; A. J. Doughty, general superintendent; Pam, Calhoun & Glennon, general counsel.

The general offices of the company will be located in the Monadnock Block, Chicago.

About 600 employees of the Bessemer & Lake Erie Railroad, a Carnegie Steel Company interest, have had their wages advanced 10 per cent., taking effect January 1. The advance was entirely voluntary on the part of the company and affects wages of the brakemen, switchmen, conductors and firemen.

# The Decorating of Sheet Steel Painted Ware by Machine Methods.—II.*

BY HORACE E. WHITNEY, CAMBRIDGE, MASS.

### Air, Rubber and Composition Cushions.

It is necessary that our dies be backed by a soft cushion, which will give them, when under pressure, the greatest possible flexibility, so that they will conform themselves to any surface, thereby giving a clear, sharp impression, whether the surface be flat, uneven or yielding. There are three kinds of cushions which will best accomplish this purpose:

1. The air or pneumatic cushion, which is the best of all types. The simplest way to make this cushion is to procure a piece of sponge rubber ¼ inch thick, and of the required size, and punch ¼-inch holes, very close together, all over it. Thus, when the stamp is cemented on one side of this cushion, and the other side mounted to a wood back or support, a series of round rubber air cells are formed. Another very good form of air cushion, but much more difficult to attach, is one patented by T. S. Buck of New York. This cushion has the appearance of a honeycomb and the cells are about ¼ inch square, ¼ inch deep, with division walls of less than 1-16 inch in thickness. The first kind of air cushion will suit all purposes, however, and is much cheaper to make and easier to attach.

2. The sponge rubber cushion. For flat surfaces which do not yield much with pressure this type of cushion will answer well enough. It consists of simply using the sponge rubber in ¼ inch thick sheets, without punching the holes. It has this advantage, that it has more surface for affixing the cushion both to the die and the support; and this is an important feature, as the tacky nature of our sizes exerts a strong pull on the stamp, tending in practice to loosen it from the cushion, or the cushion from the support.

3. The composition cushion, made from the composition which we have shown how to prepare in the second article. This makes an excellent cushion and has for its advantages simplicity and cheapness.

A very simple mode of making and at the same time attaching to the stamp and support is as follows: Take a small tin pan the size of the stamp to be cushioned, and about ¾ inch deep, with straight sides. Thoroughly grease the inside of the pan with lard oil, and lay a piece of ¼-inch wood, the size of the pan, on the bottom of the pan. It is well to have two small tin strips soldered on each end outside of the pan, of sufficient length to bend over the pan edge and press firmly down on the board. These will keep the board fixed on the bottom of the pan and prevent its rising or moving from place. Melt some composition and pour into pan, on top of the wood support, until it reaches the depth of about ¼ inch above the board. Just before the composition begins to set lay the back of the stamp on top of the composition, being sure that it is perfectly level, and allow it to float there until all has cooled and hardened. It may then be removed from the pan. Any rough or projecting edges may be trimmed off with a sharp knife. Although this is rather a crude method, still if sufficient care be used it will be found a very satisfactory one.

### Sizes and Inks.

The size is a viscous agent of the dies, used to retain the bronze on the surface to be decorated in a duplicate design. If the reader has ever tried decorating by the aid of hand stamps he will have realized the great difficulty in obtaining a satisfactory size. A good and suitable size should be adhesive, nonspreading, quick drying and durable. An excellent size which has all these properties is as follows:

*Size.*

| | Parts. |
|---|---|
| Chrome yellow (Windsor & Newton tube) | 1 |
| Printers' ink (best grade yellow) | 2 |
| Best elastic coach varnish | 1 |
| Best white copal varnish | 1-3 |

This size costs about 6½ cents per ounce, mixed.

The idea of using yellow ink is to obtain a golden colored size, so that it will in no way show through the bronze. So little size is required in decorating a piece of ware that it is not well to try to economize at the expense of the materials.

This size is intended for the rubbing in of gold bronze, but silver, aluminum, or any of the fancy colored bronzes may be used. In fact, the different colored sizes make a very pretty ornamentation by themselves. This practically gives an unlimited range of decorating colors.

Some very pretty effects may be produced by rubbing in one part of the design with one colored bronze and the other part with another shade. By using several dies at different operations many beautiful and endless elaborate designs may be produced. For the better class of goods this method of first sizing and then bronzing is to be preferred, and the decorations thus produced always have much more brilliancy.

For the cheaper class of ware, a bronze ink may be used, which will produce the decoration with a single operation, thus saving bronzing and cleaning:

*Gold Stamp Ink.*

| | Ounces. |
|---|---|
| Bronze | 2 |
| Glycerine | 3 |
| Alcohol | 2 |

This gold ink costs about 4½ cents per ounce.

The bronze in the above must be very fine, and it should be as brilliant as possible without sacrificing fineness. It is sometimes advisable to add a small quantity of elastic coach varnish, just enough to produce a slight tackiness.

The first size mentioned, as already stated, may be used by iself and the range of colors is obtained by varying the colors of the printers' ink. This way makes the most satisfactory colored inks.

### The Care of the Dies or Stamps.

All these sizes tend to shorten the life of the stamps or dies which are made of rubber. Water, alcohol and acids do not dissolve India rubber; on the other hand, ethers, bisulphide of carbon and essential oils tend to dissolve and leave it behind after the volatilization of the solvent. Turpentine belongs to the class of essential oils and has a solvent effect on India rubber. While the spirits of turpentine is not a perfect solvent for vulcanized rubber, it nevertheless exerts on the rubber dies a very detrimental effect. The varnishes used in the sizes likewise are injurious to the rubber dies. Turpentine should never be used in cleaning and when used in thinning the sizes should be used very sparingly.

Just as soon as the dies are no longer being used they should be thoroughly cleaned with a stiff brush dipped in alcohol. Stamps which are in constant use should be frequently cleaned in this manner. The size is of a fatty nature and will fill up the crevices of the design in the stamp, if constantly worked and not cleaned. They should never be left, even over night, without first giving them a thorough cleaning, and it is better to always clean them while the size is in a wet condition, because after it has dried it is much harder to clean off. With proper care they will last quite a while and do many pieces of ware. A good word may be said here for the composition dies, as the size has little or no effect upon these.

### Hand and Automatic Sizing Rolls.

There are two modes of applying the size to the dies and rolls. The first, the slowest method, is accomplished by hand with a roller of a soft pliable material. The size is spread on a marble slab, and worked with a roller until the slab is thinly and evenly coated. When in the right condition it exerts a strong stickiness to the roller, and at the same time produces a crackling sound. Care must be used not to have the size too thick, and turpentine may be used very sparingly on the slab as a thinner. After the roller is thoroughly coated it is rolled over the dies, thus transmitting the size to their surface.

The material best suited for these hand sizing rolls is the composition already considered. The general working directions apply the same to the rolls as to the dies. These rolls are the same as the printers use and may be purchased from any printers' supply house. They are, however, simple and easy to make, and the only articles required in addition to those already used for the composition are a mold, core pin and handle frame. For the

*Continued from *The Iron Age*, December 26, 1901, page 12.

mold, procure a piece of seamless brass tubing of the required length, which depends wholly upon the length of stamp to be sized. The roller should, in most instances, be long enough to roll over the surface of the die with one rolling. The diameter is not so important a feature, but about 1¾ inches is found to be convenient for a 6 to 8 inch roller.

Fig. 6 will clearly show how to make a mold and core rod for one of these rollers.

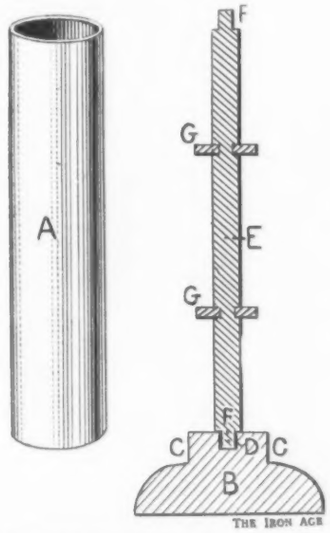


*Fig. 6.--Mold for Casting Composition Rollers.*

A is a seamless brass tube; B, a hard wood base or support for the tube; C, a shoulder to fit inside of tube so that it will slide off and on; D, a hole to fit core rod; it should be small enough to only allow the rod to enter up to the shoulder. E is the core rod; F F, a shoulder turned on the core rod to fit the handle frame; G G are core pins (⅜ inch projecting each side) to prevent the roller from turning on the core rod.

Melt sufficient composition to fill the mold and in the meantime thoroughly grease the inside of mold tube and the part of the base which comes inside of the tube. Insert the core rod in the base, being particular that no oil gets on it, and that it stands perpendicular. Put the brass tube on the base and pour enough composition into the mold until it reaches the top shoulder of the core rod. When cool remove the tube from the base, then push the roller out of the tube. A hand frame will be required to hold the roller in and can be bought of any printers' supply house.

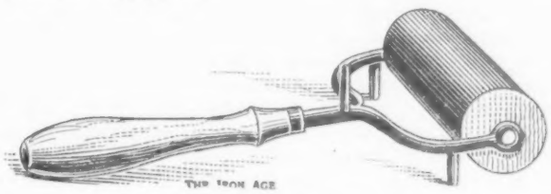


*Fig. 7.—Hand Roller and Frame.*

The automatic feed roller differs from the hand feed roller in that the roll itself is filled with size, which automatically feeds and covers its surface. It can be used in a handle frame or in conjunction with the machines described later on. This self feeding roller consists of a perforated tin roll, one end of which removes so that it can readily be filled with size, and is shown in Fig. 8.

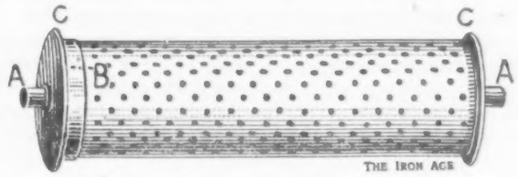


*Fig. 8.—Automatic Self Feeding Roller.*

A A are the shaft pins on which it revolves, B the removable end for filling, and C C the shoulders to hold on the covering. The ends, of course, should not be perforated, and the perforation on the body part should not run nearer than ¼ inch to the ends. The ends should project up above the roll about ⅛ inch all around so as to act as a washer to keep the covering in place. The perforation holes should be about 1-32 inch in diameter and fairly close together. This roll is covered on the surface, between the shoulders, very tightly with a piece of felt from ⅛ to ¼ inch thick, and the ends closely sewed together. This felt is then covered in a similar manner with a piece of thin silk.

Fill the roll with size, which is somewhat thinner than that used for a hand roller, and work back and forth on a marble slab until the size works through and evenly covers the surface of the roll. It is then ready for use and as long as the size inside is kept at the proper consistency it will automatically feed through the perforations and keep the outside surface of the roll amply sized. After using the roller, always remove the size, and put the roll into turpentine to soak until needed for use again. This is very important, for if the roll is allowed to harden the feed holes will become clogged and the feeding will cease.

**Decorating One or More Flat Surfaces.**

Having described in the previous articles the fundamental parts of our process, we will now apply these to the process itself and first consider the application of the design to flat surfaces of the same or of different angles and levels. The class of ware to be decorated under this order consists principally of bread, cake, cash and spice boxes, cake closets, match safes, child's and crumb trays and waiters. These goods, as well as many others which in practice will suggest themselves, come under the class of flat surface decoration.

The essential success of the use of dies is in attaching them to a machine whereby they always move in the same path and produce their imprints on all ware alike. It is also necessary in order to accomplish this that the goods to be decorated are always in the same relative position to the dies. The machine best suited to effect this purpose is one of the press type. Such a press, suitable for this work, is shown in Fig. 9.

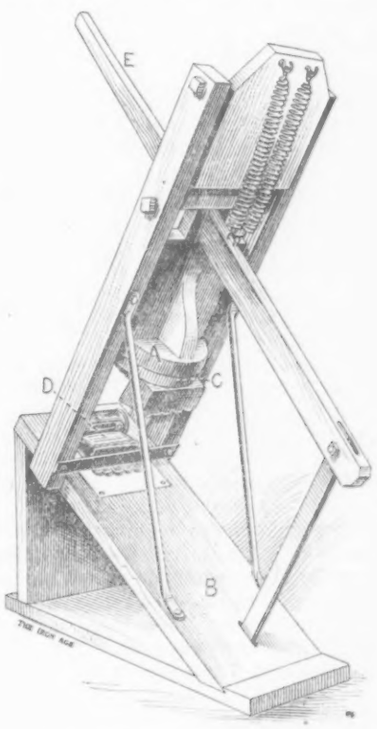


*Fig. 9.—Back View of Decorating Press.*

A is the ram or plunger plate, B the brass rod, C the support or back, showing the form and die attached; D the gauge or form for centering the article to be deco-

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BY HORACE E. WHITNEY, CAMBRIDGE, MASS.

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2. The sponge rubber cushion. For flat surfaces which do not yield much with pressure this type of cushion will answer well enough. It consists of simply using the sponge rubber in ¼ inch thick sheets, without punching the holes. It has this advantage, that it has more surface for affixing the cushion both to the die and the support; and this is an important feature, as the tacky nature of our sizes exerts a strong pull on the stamp, tending in practice to loosen it from the cushion, or the cushion from the support.

3. The composition cushion, made from the composition which we have shown how to prepare in the second article. This makes an excellent cushion and has for its advantages simplicity and cheapness.

A very simple mode of making and at the same time attaching to the stamp and support is as follows: Take a small tin pan the size of the stamp to be cushioned, and about ¾ inch deep, with straight sides. Thoroughly grease the inside of the pan with lard oil, and lay a piece of ¼-inch wood, the size of the pan, on the bottom of the pan. It is well to have two small tin strips soldered on each end outside of the pan, of sufficient length to bend over the pan edge and press firmly down on the board. These will keep the board fixed on the bottom of the pan and prevent its rising or moving from place. Melt some composition and pour into pan, on top of the wood support, until it reaches the depth of about ¼ inch above the board. Just before the composition begins to set lay the back of the stamp on top of the composition, being sure that it is perfectly level, and allow it to float there until all has cooled and hardened. It may then be removed from the pan. Any rough or projecting edges may be trimmed off with a sharp knife. Although this is rather a crude method, still if sufficient care be used it will be found a very satisfactory one.

### Sizes and Inks.

The size is a viscous agent of the dies, used to retain the bronze on the surface to be decorated in a duplicate design. If the reader has ever tried decorating by the aid of hand stamps he will have realized the great difficulty in obtaining a satisfactory size. A good and suitable size should be adhesive, nonspreading, quick drying and durable. An excellent size which has all these properties is as follows:

*Size.*

| | Parts. |
|---|---|
| Chrome yellow (Windsor & Newton tube) | 1 |
| Printers' ink (best grade yellow) | 2 |
| Best elastic coach varnish | 1 |
| Best white copal varnish | 1-3 |

This size costs about 6½ cents per ounce, mixed.

The idea of using yellow ink is to obtain a golden colored size, so that it will in no way show through the bronze. So little size is required in decorating a piece of ware that it is not well to try to economize at the expense of the materials.

This size is intended for the rubbing in of gold bronze, but silver, aluminum, or any of the fancy colored bronzes may be used. In fact, the different colored sizes make a very pretty ornamentation by themselves. This practically gives an unlimited range of decorating colors.

Some very pretty effects may be produced by rubbing in one part of the design with one colored bronze and the other part with another shade. By using several dies at different operations many beautiful and endless elaborate designs may be produced. For the better class of goods this method of first sizing and then bronzing is to be preferred, and the decorations thus produced always have much more brilliancy.

For the cheaper class of ware, a bronze ink may be used, which will produce the decoration with a single operation, thus saving bronzing and cleaning:

*Gold Stamp Ink.*

| | Ounces. |
|---|---|
| Bronze | 2 |
| Glycerine | 3 |
| Alcohol | 2 |

This gold ink costs about 4½ cents per ounce.

The bronze in the above must be very fine, and it should be as brilliant as possible without sacrificing fineness. It is sometimes advisable to add a small quantity of elastic coach varnish, just enough to produce a slight tackiness.

The first size mentioned, as already stated, may be used by itself and the range of colors is obtained by varying the colors of the printers' ink. This way makes the most satisfactory colored inks.

### The Care of the Dies or Stamps.

All these sizes tend to shorten the life of the stamps or dies which are made of rubber. Water, alcohol and acids do not dissolve India rubber; on the other hand, ethers, bisulphide of carbon and essential oils tend to dissolve and leave it behind after the volatilization of the solvent. Turpentine belongs to the class of essential oils and has a solvent effect on India rubber. While the spirits of turpentine is not a perfect solvent for vulcanized rubber, it nevertheless exerts on the rubber dies a very detrimental effect. The varnishes used in the sizes likewise are injurious to the rubber dies. Turpentine should never be used in cleaning and when used in thinning the sizes should be used very sparingly.

Just as soon as the dies are no longer being used they should be thoroughly cleaned with a stiff brush dipped in alcohol. Stamps which are in constant use should be frequently cleaned in this manner. The size is of a fatty nature and will fill up the crevices of the design in the stamp, if constantly worked and not cleaned. They should never be left, even over night, without first giving them a thorough cleaning, and it is better to always clean them while the size is in a wet condition, because after it has dried it is much harder to clean off. With proper care they will last quite a while and do many pieces of ware. A good word may be said here for the composition dies, as the size has little or no effect upon these.

### Hand and Automatic Sizing Rolls.

There are two modes of applying the size to the dies and rolls. The first, the slowest method, is accomplished by hand with a roller of a soft pliable material. The size is spread on a marble slab, and worked with a roller until the slab is thinly and evenly coated. When in the right condition it exerts a strong stickiness to the roller, and at the same time produces a crackling sound. Care must be used not to have the size too thick, and turpentine may be used very sparingly on the slab as a thinner. After the roller is thoroughly coated it is rolled over the dies, thus transmitting the size to their surface.

The material best suited for these hand sizing rolls is the composition already considered. The general working directions apply the same to the rolls as to the dies. These rolls are the same as the printers use and may be purchased from any printers' supply house. They are, however, simple and easy to make, and the only articles required in addition to those already used for the composition are a mold, core pin and handle frame. For the

*Continued from *The Iron Age*, December 26, 1901, page 12.

mold, procure a piece of seamless brass tubing of the required length, which depends wholly upon the length of stamp to be sized. The roller should, in most instances, be long enough to roll over the surface of the die with one rolling. The diameter is not so important a feature, but about 1¾ inches is found to be convenient for a 6 to 8 inch roller.

Fig. 6 will clearly show how to make a mold and core rod for one of these rollers.

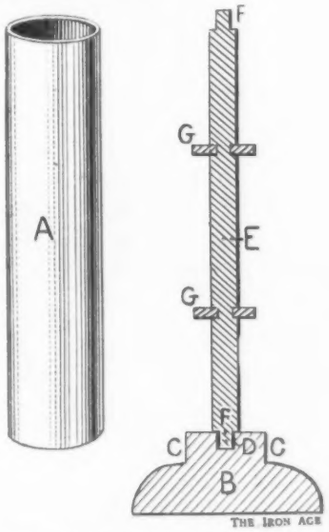


*Fig. 6.—Mold for Casting Composition Rollers.*

A is a seamless brass tube; B, a hard wood base or support for the tube; C, a shoulder to fit inside of tube so that it will slide off and on; D, a hole to fit core rod; it should be small enough to only allow the rod to enter up to the shoulder. E is the core rod; F F, a shoulder turned on the core rod to fit the handle frame; G G are core pins (⅜ inch projecting each side) to prevent the roller from turning on the core rod.

Melt sufficient composition to fill the mold and in the meantime thoroughly grease the inside of mold tube and the part of the base which comes inside of the tube. Insert the core rod in the base, being particular that no oil gets on it, and that it stands perpendicular. Put the brass tube on the base and pour enough composition into the mold until it reaches the top shoulder of the core rod. When cool remove the tube from the base, then push the roller out of the tube. A hand frame will be required to hold the roller in and can be bought of any printers' supply house.

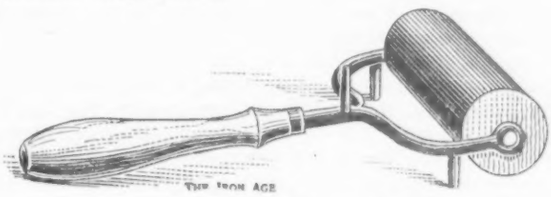


*Fig. 7.—Hand Roller and Frame.*

The automatic feed roller differs from the hand feed roller in that the roll itself is filled with size, which automatically feeds and covers its surface. It can be used in a handle frame or in conjunction with the machines described later on. This self feeding roller consists of a perforated tin roll, one end of which removes so that it can readily be filled with size, and is shown in Fig. 8.

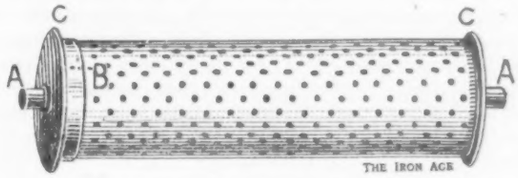


*Fig. 8.—Automatic Self Feeding Roller.*

A A are the shaft pins on which it revolves, B the removable end for filling, and C C the shoulders to hold on the covering. The ends, of course, should not be perforated, and the perforation on the body part should not run nearer than ¼ inch to the ends. The ends should project up above the roll about ⅛ inch all around so as to act as a washer to keep the covering in place. The perforation holes should be about 1-32 inch in diameter and fairly close together. This roll is covered on the surface, between the shoulders, very tightly with a piece of felt from ⅛ to ¼ inch thick, and the ends closely sewed together. This felt is then covered in a similar manner with a piece of thin silk.

Fill the roll with size, which is somewhat thinner than that used for a hand roller, and work back and forth on a marble slab until the size works through and evenly covers the surface of the roll. It is then ready for use and as long as the size inside is kept at the proper consistency it will automatically feed through the perforations and keep the outside surface of the roll amply sized. After using the roller, always remove the size, and put the roll into turpentine to soak until needed for use again. This is very important, for if the roll is allowed to harden the feed holes will become clogged and the feeding will cease.

**Decorating One or More Flat Surfaces.**

Having described in the previous articles the fundamental parts of our process, we will now apply these to the process itself and first consider the application of the design to flat surfaces of the same or of different angles and levels. The class of ware to be decorated under this order consists principally of bread, cake, cash and spice boxes, cake closets, match safes, child's and crumb trays and waiters. These goods, as well as many others which in practice will suggest themselves, come under the class of flat surface decoration.

The essential success of the use of dies is in attaching them to a machine whereby they always move in the same path and produce their imprints on all ware alike. It is also necessary in order to accomplish this that the goods to be decorated are always in the same relative position to the dies. The machine best suited to effect this purpose is one of the press type. Such a press, suitable for this work, is shown in Fig. 9.

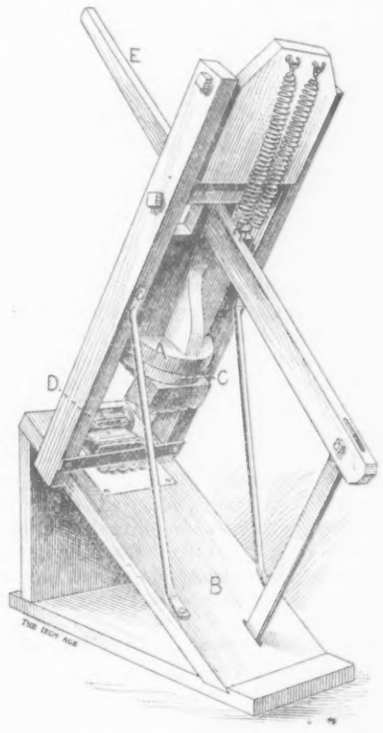


*Fig. 9.—Back View of Decorating Press.*

A is the ram or plunger plate, B the brass rod, C the support or back, showing the form and die attached; D the gauge or form for centering the article to be deco-

rated, E the lever for producing a reciprocating motion in a line at right angles to the bed. In this view the braces of the frame work and the springs which bring the dies back ready for sizing are clearly shown. The article to be decorated is also shown on the bed of the press. This type of press is made of hard wood and set at an angle for convenience of working. It is used for the smaller class of designs, such as match safes, crumb trays, &c. The die or stamp is cemented to a cushion, and all the waste edges or center or blank parts of the design are trimmed off, so that when under pressure these unproductive parts will not come in contact with the ware and produce blotches. Next the dies and cushions, being intact, are mounted to a wooden back or support, the size of the plunger plate. This wood back should be attachable to the plunger plate by thumb screws and slots which shall allow for adjustment. Each die or stamp should be thus mounted on a wood back so as to be interchangeable with the plunger plate of the press.

On the bed of the press have a form or gauge for centering the articles to be decorated, and for ease of adjustment have this gauge on adjustable plates. The first adjustable plate should be made to slide in ways across the bed, and the second plate should slide in ways on the first plate and at right angles to it. Both these sliding plates may be fixed in place by thumb screws. On the second plate fasten the gauge or form for centering the article. If the ware to be ornamented is hollow it is advisable to have a gauge or form fitted to the inside so as to prevent the buckling of the surface when under pressure.

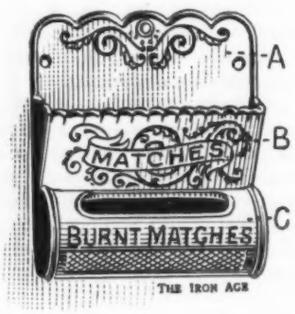


*Fig. 10.—Decorated Match Safe.*

There are on this article three surfaces to decorate at different levels and angles. The top surface A consists of tipping the top edge and stamping a small scroll design below. In making dies to tip the edge of any article, it is always necessary to have the tipping surface of the die double that of the width of the tipping or the stripe required, and always to adjust the edge to be tipped so that one-half the width of the stripe only falls on the edge. This insures thorough tipping to the edge and makes the centering and adjusting of the article much more easily accomplished.

The middle surface B lies on a slant or angle to the top surface, on which is stamped the word "Matches" and a surrounding scroll work. It also has a corrugated tipped edge. The die, which is made from an electrotype of a wood cut, must accurately fit these corrugations and this corrugated tipping surface should be double the width of stripe required, as in surface A. The bottom surface B is at the highest level and consists only of the words "Burnt Matches." The dies used in the decoration of this match safe should be cemented to cushions and mounted on a wood form. This form must exactly fit and suit itself to these three varying surfaces of the match safe. The form with the dies attached must be fastened to a support or back to fit the plunger plate of the press. It is clearly shown in Fig. 9. This match safe has been chosen to illustrate, because it is a more complex form to decorate and will, therefore, give the reader a better idea of the adaptability of the method and press for decorating this class of ware.

For larger goods such as cake and cash boxes, cake closets, child's trays and waiters, a larger machine will be required. This larger press had better be made of iron to insure even and true working and for the above class of goods should have its bed so arranged as to be able to slide the goods over it. Such a press is shown in Fig. 11.

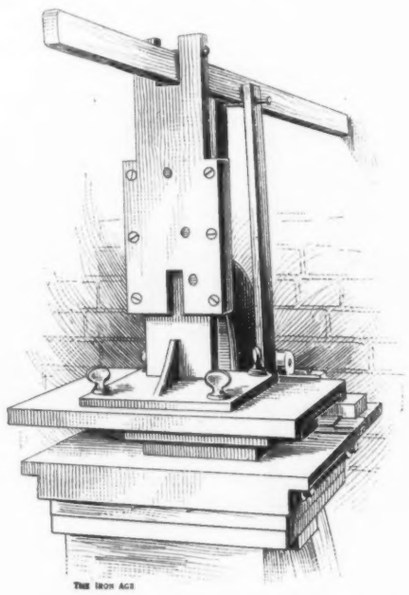


*Fig. 11.—Iron Decorating Press for Large Work.*

The modes of working this process by aid of the press briefly stated, are as follows: First adjust your dies and fasten them, in their proper position, to the plunger plate. The gauge on the bed of the press should be centered so that the articles to be decorated will have the dies, when brought in contact with the hand lever, strike them in exactly the place intended to be ornamented. Next size the dies, and having previously placed an article against the gauges on the bed of the press, pull down the lever until the dies make a true and firm impression. Upon releasing, the springs will raise the lever up for another sizing. The dies should always be sized for each impression. Remove the article, which should have a clear and sharp sized impression if the press and parts have been properly regulated. The size should not be too thick or too thin and wet. It should not blur easily to the hand and should feel very tacky. With a small pounce or chamois rub a good quality of bronze over the design and then brush off with a feather duster or damp chamois skin any surplus bronze. It is better to size a dozen or more ahead and then bronze them. Two girls may be worked to great advantage, one stamping, the other bronzing and cleaning. The piece price for completely finishing the decoration of the match safe was 2 cents per dozen, which included sizing the dies, stamping, bronzing and cleaning. This was based on the work of a man at $1.50 a day. It can be done by girls at from $4 to $5 per week basis. To do this same operation with a stencil would require three stencils and three operations. This would cost over three times as much and produce a much lower grade design.

### Decorating Round Surfaces.

All ware of a cylindrical shape, which is usually decorated with gold stripes or bands, comes under this class and consists principally of pails, cuspidors, tea cans and sugar boxes. In order to produce these stripes we shall require suitable rolls, as well as a machine to operate these rolls. The rolls have already been described in the second article, and to work these rolls a plain lathe is the machine best adapted and may be fited up as shown in Fig. 12.

A A A A are upright roll post carriers, B is the bed of the lathe, C the size roller, D the size pan, E the spring attached to the size roller, F the foot treadle, H the head plate, K K the roller frame, M the marble size slab, P P the roller posts, R the handle which throws the roll post carriers, T the tail plate, U the tail post, V the foot

treadle spring, W the sliding shaft, and X the treadle arm. This machine is for putting on four different stripes at once, thus making it suitable to any class or size of work. The head plate H, which carries the ware, screws in place, and one will be required to fit each piece

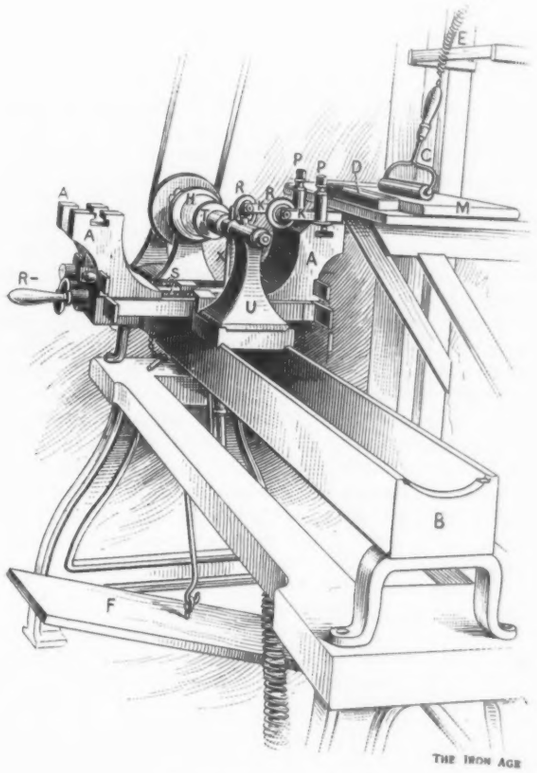


*Fig. 12.—Striping Lathe.*

of ware. This also applies to the tail plate T, which is free to turn, and is fastened by a thread to the shaft W, which slides back and forth in the tail post U. This sliding shaft is worked back and forth by the treadle arm X. The tail post also slides on the bed B, being fastened in any position by a clamp underneath. Thus, when the article to be striped is placed in the lathe against the head plate, the tail post being clamped at its proper distance, a pressure on the foot treadle will cause the tail plate to move forward and clasp the article, causing it to revolve rapidly when the power is on the lathe. The crank R, by a roll and wedge, when turned to the right throws the rear roll post carriers forward, while a turn to the left likewise throws the front ones. On releasing, the springs S S push them back again. The rear roller posts P P (the front ones not being in place when photographed) both turn and slide in their carriers. The roller frames K K, which carry the rubber decorating rolls, also slide in these posts.

Thus, as may be seen from the above, every part is adjustable to any size or shape of ware. Directly back of the lathe is a wooden frame work or stand with a shelf which holds the marble slab M, the size pan D and the size or composition roller C. This roller is attached to the frame work by a spring, E, for convenience of keeping the roller out of the way, yet always having it within handy reach.

The gold stamp ink should be used with this machine and the mode of operation is as follows: First, screw the proper head and tail plate in place, adjust and clamp the tail post in a position so that when the treadle touches the floor it will tightly clamp the article to be decorated. Adjust the roll post carriers, roller posts and roller frames so that the rubber rolls will when the crank is thrown bear firmly at the proper angle and exactly in the desired place on the article. The rubber rolls, as previously stated, should be as soft and pliable as it is possible to make them, so that in case of pails, &c., being made of light stock, the pressure required to pass over any raised seams in the ware will not buckle it. Having everything properly adjusted, the power turned on, and the ink in the right condition on the slab, put the article against the head plate and the foot on the treadle. With the left hand throw the crank, bringing the rolls to bear, and at the same time touch the ink roller to the top of the rubber rolls, which will instantly convey the ink to the article, producing a gold stripe on it.

The idea of the four upright roll post carriers is to carry two front and two back rollers, so that four stripes may be rolled on at the same time; thus a fine stripe may be rolled on very close to a broad stripe. For slop pails, cuspidors and other articles requiring only a two-band decoration only the rear set of rollers need be used. The writer has seen a boy working this machine striping pails so rapidly that another boy helper could not keep the work clear. There should be sufficient room on both sides of this lathe so that a boy may keep the ware to be striped piled at the worker's left, and remove it as it is decorated and piled on the right side.

An automatic size or ink roller may be used, or set to bear automatically upon the rolls, in place of hand roller, if desired. Although the above type of machine may seem rather complicated it is preferable for general work on account of its adjustability. However, if only two-band work is required a much simpler one can be constructed.

**Decorating Oval Surfaces.**

The kind of goods which come under this head are principally waiters or tea trays. Any oval, as well as some classes of round ware, may be ornamented in this way.

We will take up first the mode of plain banding an oval tea tray and the roll used for this work. As the band is to be about ½ inch wide, the groove or bearing surface should be of this width, and its contour must be exactly the same as the edge of the waiter where the band is to be put on. To operate this roll, a machine will be required entirely different from that used for the flat or round surfaces. The one best adapted for this work is used by the tinsmith, and is known as the crimping machine. Peck, Stow & Wilcox Company of New York manufacture them and their list price is $18.

A is the top shaft for the decorating roll, B the lower shaft for the roll which carries the tray, C the decorating roll, D the carrier or bearer roll, E the attachment for

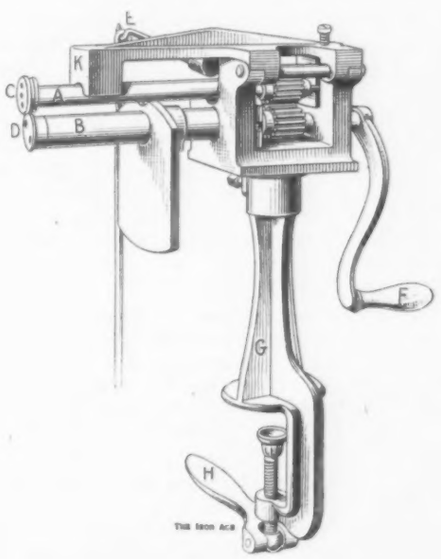


*Fig. 13.—Crimping Machine for Oval Decorating.*

the foot treadle, which causes the roll C to bear on the tray to be decorated; F the handle or crank which revolves the shafts A, B; G the bench stand or support, H the clamp for attaching to the bench, and K the top shaft bearing stand.

Some changes and additions from what is shown in the cut will be necessary to make this machine suitable for oval decorating. First, about 2 inches of each end

of the shaft should be turned down to about half their diameter, and each of these ends threaded to take a large nut. The object of this is to make an easy way for connecting the rolls to the shaft. In order to size the roll C we shall need an automatic self feeding roll, as previously described. It should be about 3 inches in diameter and about ½ inch in thickness. The perforated surface must be rounding, so that when it is covered with felt its bearing surface will exactly fit and bear fairly upon the groove surface of the banding or design roll.

This size furnishing roll ought to be put in a frame made of ⅛ x ½ inch band iron, fastened by two small machine screws to the top of the shaft bearing stand K. By bending the frame to the proper angle the feed roll can be made to bear firmly and evenly to the design roll, and as the banding roll turns it will likewise cause the feed roll to revolve, thus automatically feeding the size to the band or design roll. A carrier or wood bearing roll, D, should be turned to exactly fit and conform to the under side edge of the waiter or article to be decorated. A table or stand, which may be conveniently raised or lowered, should be made and so placed on the bench side of the machine that when the article to be decorated is firmly caught between the two rolls it will rest on this table and slide easily over its surface as the rolls cause it to rotate.

Now, to decorate a waiter, put the banding roll in place on shaft A, the carrier roll on shaft B, and turn the nuts up tightly, so that they cannot revolve on their respective shafts. Fill the size roll and adjust it in its proper position. Take a waiter, put the edge to be decorated between the rolls, place the foot on the treadle and bear down until the top roll firmly grips the tray, causing its under edge to rest firmly on the carrier roll. The tray when in this position should lay perfectly flat upon the table. Rotate the handle F until the banding roll has traveled over the entire edge of the waiter. Release the pressure of the foot and withdraw the tray, which should have a perfectly sized band around its edge. This can now be bronzed and cleaned.

Always turn the handle around several times before putting in a new waiter, so as to completely size the roll. If the contour of the edge of the tray varies in the different sizes, rolls will have to be made for each size.

## Compressed Air Haulage in Mining.

Before the Engineers' Society of Western Pennsylvania Richard Hirsch presented a paper on "Compressed Air Haulage Plants," in which he quotes from a test under the supervision of J. H. Bowden, late chief engineer at No. 6 colliery of the Susquehanna Coal Company, located at Glen Lyon, Pa. At this plant they operate two Porter 8-ton motors, having 7 x 14 inch cylinders; tank capacity, 130 cubic feet; pressure, 500 pounds per square inch. The following is a summary of the results:

| | |
|---|---|
| Total cost of plant, not including steam boilers, cars or track | $15,156.00 |
| Total cost of operating plant for 179 days, including all labor, fuel, supplies, repairs, &c. | 2,202.78 |
| Fixed charges, including interest, repairs and depreciation on plant complete, including boilers | 1,776.60 |
| Total cost of operation for year 1897, during which the plant was operated but 179 days | $3,979.38 |
| Previous to the installation of the air plant, all coal was hauled by mules, numbering over 30, and valued at | 4,052.48 |
| The cost of operation by mules, including all labor, supplies, interest, depreciation, &c., for 179 days | 11,328.63 |
| Cost of same work by compressed air | 3,979.38 |
| Saving by compressed air for 179 days | $7,349.25 |

At the average rate of saving for the year 1897 the entire cost of plant would be saved in 361 working days.

The average daily work of these two motors for the 179 days was 1185 net ton miles. This makes the cost of hauling coal in this plant, under the then existing conditions, less than 1.9 cents per net ton mile. The cost of the same work by mule power was 5.34 cents. In his report Mr. Bowden stated that to operate the plant to the full capacity of the two compressors, and for 300 days per year, would bring the cost of operation, including fixed charges, to 0.547 cent per gross ton mile, or 0.984 cent per ton mile net load.

## The Progress of Electricity in 1901.

In the elaborate Annual Financial Review published by the New York *Times* there is an able article from the pen of Thomas Comerford Martin, editor of the *Electrical World and Engineer*, from which we quote the following:

There was growth in all telegraphic work during 1901, but it was not by any means commensurate with that in other electrical fields, and was in sharp contrast to the feverish activity in the rival art of telephony.

The Marconi achievement in signalling by etheric vibration from Cornwall to Newfoundland has made a deservedly deep impression on the public mind, but much remains to be done to render any such system commercial. At present wireless methods are not "selective." In other words, only one set of apparatus at any point can work at one time; otherwise there is dire, hopeless confusion. Further, the rate of transmission is much slower than that of cables.

Nevertheless, let us rank high in the list of the great deeds of 1901 that instantaneous flashing of signals across the Atlantic by unfamiliar apparatus, with electric waves, whose character is still indeterminate, employing a medium over whose very nature the profoundest philosophers are still in liveliest dispute. Concretely the Marconi system was adopted by the English Lloyds last year, and ships that pass in the night or out of ken at any hour are hereafter and forever within tangible communication with the shore.

Telephony is the handicap on land telegraphy, and during the past year its rate of growth in the United States has been little short of frantic.

At the beginning of 1901 there were 800,000 Bell telephone stations; in July a prominent official of the system testified before the Industrial Commission that there were 900,000. The year closes with at least 1,000,000, showing an increase of from 20 to 25 per cent. Meantime the "independents" have been correspondingly active, and at the present time claim a much larger number of subscribers than the "old line" companies. This is, however, difficult of proof, as a great deal of the new competitive apparatus has been wholly renewed within a few years, and the net result does not appear in plain outline. It is undeniable that the efforts of the independents have given a stimulus to the art, and that the public has correspondingly benefited in better service and lower rates, the cost being indeed often below the remunerative point.

Probably at this moment there are some 5000 independent telephone exchanges in the country, but many are insignificant or are being drawn into systems and networks inevitable if good service is to be furnished over any given area. The old debate as to whether two telephone exchanges can long maintain themselves apart in any community is as rife as ever; and, *ad interim*, larger, finer and costlier exchanges were put up and started this year where others already existed.

Technically the greatest advance outside the more general employment of "central energy" and "lamp signal" methods in the exchanges was that of Dr. M. I. Pupin in devising circuits enabling speech transmission at greater range with fuller clearness than before. His patents were taken over at a handsome figure by the Bell authorities. During the year the "telegraphone," or recording telephone, was introduced in this country, but up to date it has not been put in commercial shape. Apparently it has a bright future when worked out. Automatic telephony from exchanges with operators also made industrial progress during the year.

Electric lighting has been very progressive during the year, but chiefly along well established lines. Old power plants have been made larger, and the newer stations cap the climax. High water mark is naturally touched by the Waterside Station of the New York Edison Company on the East River, which swung into line this Christmas to meet the imperative demands for current. It is as big as a cathedral, and by next New Year's its sixteen huge direct connected units will be delivering not far short of 150,000 horse-power of current to consumers in Manhattan Borough. This is but typical of work all over the country, amounting in the

aggregate, it is said, to from $100,000,000 to $150,000,000 increase in lighting capital—the first time in some years that lighting has emulated traction in its rate of growth.

The keynote of novelty has been struck in two exactly opposite directions. Central stations now using reciprocating steam engines are beginning to adopt steam turbines, as at Hartford, Conn., while others are in view for Boston, &c., and Mr. Yerkes proposes them for his traction work in London. Decidedly they lay hold on the future for driving dynamos, and so do gas engines. At the other end of the lighting scale are the lamps, and here we find two marked novelties, one the Nernst lamp, using an incandescent substance that glows without consumption in open air, and the other the Cooper-Hewitt tubes, in which, with remarkable economy and brilliancy, gleams a mercury vapor or arc.

In the department of electrical traction the advances have been quite notable. The *Street Railway Journal*, which keeps tab on such things, showed in June that the total capitalization in street railways was a few thousands shy of $2,000,000,000, exhibiting an increase of $150,000,000 for the year, and virtually the whole of that was electric. This is average, normal work all over the country, but beyond that we have had the going into operation of the Boston elevated with multiple unit cars and third rail current methods, and the steady pushing of work for the electrical equipment of the Manhattan Elevated, some of whose cars will soon feel the electric impulse, and all of whose stations have been wired for electric lighting.

No sooner was this situation well in mind than the possible near supersession of steam in other traction work was emphasized by two incidents. The first of these relates to the remarkable high speed experiments at Zossen, where, over a Prussian military railroad, an electric car has already "hit it up" to 100 miles an hour and shown itself capable of doing 130. This certainly means much in future railway work, and was already the topic of discussion when the Pennsylvania Railroad calmly announced its intention of penetrating to the heart of Manhattan Island by a tunnel from the Jersey shore and running its trains through by electric power.

And while the New York Central, with a confessedly heavy problem on its hands, is still deliberating on electric traction for its Park avenue tunnel, the Great Northern Railroad, on the far Pacific Coast, and the London & Northwestern—not to mention other big lines—make public their intention to get down wholly or in part to electric traction as soon as possible. Here are data that need no comment. As to the familiar trolley work, several systems have been formed this year, competing with steam roads over large areas. Some of these reticulations include 1000 miles of cross country track.

Incidental to twentieth century lighting and traction work is the problem of transmission, and here again 1901 has been a record maker. For the Zossen trials current at 10,000 or 12,000 volts has been delivered direct to the car with success, but out in California the Bay Counties Company, seated on the Yuba River in a cleft of the Sierras, and covering with their circuits a very large part of the whole State, have actually transmitted their current over 220 miles for commercial purposes. Across mountain and plain and wide arms of the sea to Oakland, 140 miles, and then southward around the long curve of San Francisco Bay, the lines run until they touch well nigh Seal Rock and the Golden Gate. Potentials up to 50,000 and 60,000 volts are used, and appliances ranging from an ore crusher to a dental lathe depend upon the movement of the far off stream as it jumps into sunshine from the shadow of the pines.

One other curious and interesting traction development the past year has seen—namely, that connected with the new art of telpherage, or the towing of material by a motor that runs along wires delivering propulsion current to it. An early joke in telegraphic days embalmed the ignorance of the old lady who wanted to telegraph a pair of Wellington boots to her son. That musty pleasantry has come true. The busy little "telpher," improving every hour, is already scuttling over many circuits, hauling goods, produce, ashes, castings, &c., and it is stated, has just been adopted for handling freight on Brooklyn and New York docks. The aerial tracks consume no space, and are out of the way, and the amount of material that can be transported in small bulk with assiduity is little short of marvelous. The system is now proposed for mail transportation overhead in rural districts and for tube work in cities, replacing the rather discredited pneumatic system.

Automobilism is another branch of electric work. It cannot be said that 1901 was altogether a propitious year for it. Electric automobile "securities," speculated in with great eagerness, underwent a terrible decline, and reorganization has been the order of the day. But the industry is still there. With the storage batteries available the results are encouraging, and even if it were not so, the iron-nickel battery of Mr. Edison embodies possibilities that cannot be dismissed off hand. You can never tell what will happen in electrics, but while 1901 was perhaps the nadir of electric automobilism, it is not unduly optimistic to predict that 1902 may see the curve rising to the zenith. Just here it should be noted that in general electro-chemistry made great progress last year, as also did electrometallurgy. Outside of traction the storage battery has been in excessive demand during 1901, and for central station equipments, electric railway auxiliaries and isolated plants has gone in everywhere.

The field of electric heating has also been active, and apparatus of this class has come into very general demand. A striking addition to resources in this branch has been made in 1901 by apparatus introduced from Germany. Hitherto electric heating has been mainly done by wires imbedded in asbestos, enamel, fire clay, &c. The new apparatus is simply a metallic paint spread thinly on mica, so that practically it is all radiating surface. For this there would appear to be an illimitable field, just as there has been for the incandescent lamp.

It would be fairly safe to say that no new factory of any importance or magnitude in the United States went into operation in 1901 where electric motors did not find a place. The largest have been equipped throughout with electric power, and the same statement might truthfully be made of most mills, mines, docks, &c. The elevator of the Washington Monument was "electrified" this year. The new Government Mint at Philadelphia is driven by electric motors. The grand new Government Printing Office at the national capital is being equipped throughout with motors. And the printing plant just shipped to the Philippines is electric also. The Fore River shipbuilding yards depend on electric motors, and the big Edison cement works near Easton, Pa., have electric motors throughout from 100 down to 5 horse-power.

Thus it goes all along the line of industry.

Before closing these notes it may be said that electrical manufacturing concerns have experienced great prosperity during 1901. Their strictly electrical output has fallen not far short of $100,000,000, produced by about 750 manufacturers. Prices have been good, and a great many plants have been running overtime, being now also stacked up with large orders.

The question is raised as to the effect of the fluctuations in copper. In reality this cuts less figure than is supposed. In dynamos, motors, transformers, &c.—the bulk of heavy apparatus—cheaper copper means probably not 5 per cent. saving. As to circuits, that is another matter, but with copper at its top notch, aluminum has come largely into use and higher voltages have kept down the size. Electrical manufacturers are necessarily interested in copper, but, be it cheap or dear, their industry will thrive.

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**Joliet Records.**—The Joliet works of the Illinois Steel Company begin the year 1902 by breaking several of their previous records. On January 1 in 24 hours the converting works got out 228 heats, aggregating 2338 tons, as against their best previous record of 225 heats and 2294 tons. The billet mill in the same 24 hours produced 2069 tons, against its best previous record of 2032 tons.

## Important Railway Improvements.

Many signs are apparent that many of the railways of this country are undergoing changes which, in the course of the next few years, will greatly alter the topography of them, and their physical features as well. The Pennsylvania Railroad is doing a large amount of work upon the main lines in reducing grades and eliminating curves, the effect of which will be visible in the operating expenses of the near future, and, as we have already noted in a previous issue of *The Iron Age*, the orders for locomotives are very large. These last, however, refer to facilities for handling traffic, but the increase in their size and weight will necessitate other changes in the permanent way, which will keep the rail mills of the country busy for some time to come.

Not so very many years ago the standard steel rail in use weighed 65 pounds to the yard; this, soon after, was increased to 75 pounds per yard, which was thought amply heavy enough for any work the roads would have to do. Possibly it would have been, if the schedule speeds then adopted had been continued, but when they rose from 25 and 30 to 40 miles per hour the 65-pound rails were found too light, and as a provision for any future emergency, or still higher speeds, some of the great trunk lines laid rails weighing 100 pounds to the yard. The enormous locomotives of the present day, however, are said to wear even these most rapidly, so that it is a question of only a short time when the weight of rails will have to be materially increased.

The New York Central Railroad is also spending a large amount upon the main line at Utica—over $1,000,000 at this one point alone. In connection with the civic authorities improvements have been planned which involve a unique undertaking, no less than changing the course of the Mohawk River for a distance of a mile or more, the land so reclaimed being turned over to the railroad people, who intend to make several important changes. If this were a mere local improvement it would scarcely warrant allustion to it, but it is more than that, for the alterations involve the moving of tracks, building a new passenger station to cost over $200,000, and a new freight house also, the intention of the railway people being to, in the fullness of time, do away with the three divisions of the road between New York and Buffalo, having two divisions only, Eastern and Western, with Utica as the center. These improvements will give employment to a large number of persons.

Although there is no very great amount of new track announced for the present year, the changes to be made in other lines than those mentioned are virtually new railroads, and set forth that these properties are to be managed differently in the future from what they have been in the past. The directors realize that dividends can be paid upon the losses incurred heretofore by malconstruction and want of experience. Upon no other ground can the vast sums now being expended be comprehended, for money is not spent for the sake of change merely. As a matter of fact, the public demand for higher speed and better facilities in the matter of freight transmission are the causes of the changes noted previously. The railroads of this country, with but few exceptions, are not adapted to very high speed (by which is meant over 60 miles an hour), being never designed for it. Nor was it warranted by the lay of the land. High speeds are costly where lines follow tortuous water courses, and hilly country, but they are maintained on some parts of trunk lines because they must be. On some lines out of New York City the highest velocity attained by the fastest trains is barely 41 miles per hour, for it still requires five hours to go to Boston, distant 217 miles. The time to Washington is, by the fastest trains, run only at certain hours daily, slightly over 45 miles per hour, which is a long way from 60 miles per hour, consecutively. This low average is not because modern locomotives are not capable of this velocity under fair conditions, but is owing to the nature of the roads themselves. With a fairly level track and a clear right of way, unobstructed by frequent checks in passing through large towns and cities, an average speed of 60 miles per hour could be kept continuously, and it is doubtless with the view of reducing these obstacles to their lowest terms that the changes noted are being carried out.

## The Ransom Emery Wheel Dresser.

The new emery wheel dresser made by the Ransom Mfg. Company of Oshkosh, Wis., is designed to be attached to their 20-inch water tool grinder. The handle is formed with a hole in it about 2 inches back from the cutters, which slides along a rod carried by the frame of the device. This answers the purpose of a slide and fulcrum combined and allows the tool to be brought in contact with the entire face of the wheel. The frame is secured to the hood of the grinder by two screws. The dresser can be lifted out of the way, as indicated in Fig. 2, or can be removed by loosening the screws.

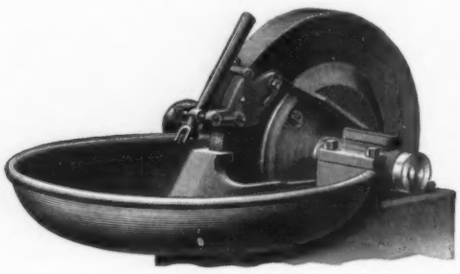


*Fig. 1.—In Position for Operating.*

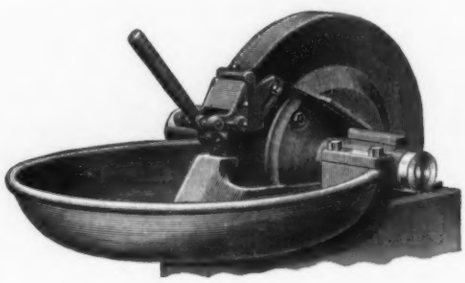


*Fig. 2.—Handle Thrown Back.*

THE RANSOM EMERY WHEEL DRESSER.

## The Amalgamated Association.

A call has been sent out for the next annual convention of the Amalgamated Association, to be held in Wheeling, W. Va., on April 15. As the secretary-treasurer is required to furnish sublodges with the programme six weeks before the convention meets, consequently all suggestions for the programme must be in the secretary's possession before February 17, 1902, or they will not appear. Delegates must be elected at the first regular meeting in March, and their names be sent to the national office. The convention this year will probably attract less attention than usual, for the reason that the strike last summer caused the loss to the Amalgamated Association of a very large number of mills and greatly decreased the strength of the organization. It is probable that strenuous efforts will be made to build up the organization among the mills of the United States Steel Corporation, but it is not believed that much headway can be made in this direction. The mills that were made nonunion during the strike last summer will very likely continue so. The Amalgamated Association is also very likely to be conservative in the matter of asking advances over present wage rates, as there will be no desire on their part to engage in another conflict.

## The Drawback on Expanded Steel Lath.

WASHINGTON, D. C., December 31, 1901.—The Treasury Department has issued an interesting series of regulations providing for a drawback of duty paid on imported steel sheets used in the manufacture of so-called "expanded steel lath," in which an important principle is laid down with regard to allowance for wastage. The application of the manufacturers for regulations under which drawback would be allowed stated with reference to waste in manufacture that three items must be taken into account: 1, The loss of weight by reason of the action of the pickling bath into which the sheets were dipped for the purpose of removing the scale thereon; 2, on account of the trimming of the sheets to bring them to a standard size; and, 3, because of spoilt sheets resulting from the improper action of cutting and expanding machines, &c.

It was estimated that the loss from pickling was 3 per cent., and from each of the other causes 1 per cent. The special agent assigned to the case made a very careful examination into the methods of manufacture and reported in favor of the issuance of regulations, but suggested that the wastage allowance be limited to the 3 per cent. loss through the action of the pickling bath. This recommendation the Department has adopted on the ground that the waste cut from the sheets as well as the spoiled sheets are available, even if only as scrap metal, and hence drawback of duty should not be allowed thereon as the waste material may subsequently be used in the manufacture of articles for domestic consumption. The regulations as finally promulgated are as follows:

On the exportation of expanded pressed steel lath manufactured wholly with the use of imported steel sheets by the process of pickling, trimming, cutting and expanding, a drawback will be allowed equal in amount to the duty paid on the imported material so used less the legal deduction of 1 per cent.

The preliminary entry must show the marks and numbers of the shipping packages, the number, length, width and gauge of the sheets of lath contained in each package, and the average gross and net weight per package for a given gauge. Each package must be so stenciled or marked on the covering sheets as to show the number of sheets of lath it contains, their length, width and gauge, and the gross and net weight of the same.

In the drawback entry must be shown the total number of sheets of lath exported of each length, width and gauge, and the net weight of the lath stated separately for each gauge, together with the length, width and gauge of the imported sheets from which the exported sheet laths of the various gauges and dimensions were made. The said entry must further show, in addition to the usual averments, that the exported merchandise was manufactured of material and in the manner set forth in the manufacturer's sworn statement.

In liquidation the weights of imported steel sheets of the several gauges which may be taken as bases for allowance of drawback may equal the net weights declared in the drawback entry after official verification of exported gauges and weights; provided, that to such weights may be added 3 per cent. of the same to compensate for loss incurred in the manufacturing process.

W. L. C.

**Manufacturing in Virginia.**—The Census Bureau has issued a preliminary report on the manufacturing industries of Virginia, which shows a total of 8245 manufacturing establishments in 1900, an increase of over 39 per cent. during the decade. The total capital was $103,512,855, an increase of 63 per cent.; average number of wage earners, 72,527; increase of 35 per cent.; total wages, $22,396,060; increase of 41 per cent. The miscellaneous expenses were $12,258,244, an increase of 65 per cent.; cost of materials used, $74,762,749; increase of 49 per cent.; value of all manufacturing products, including custom work and repairing, $132,735,620; increase of 50 per cent.

# Standard Pipe Unions.

## Report of the Committee on Standard Pipe Unions of the American Society of Mechanical Engineers.

E. M. Herr, A. S. Vogt, M. J. Baldwin, G. M. Bond and Stanley G. Flagg, Jr., are the signers of the following report to the American Society of Mechanical Engineers:

Your committee appointed to consider the subject of securing uniformity in the threads of coupling unions for pipe, in joint conference with similar committees of the American Railway Master Mechanics' Association and the Master Car Builders' Association, begs leave to report as follows:

After considerable delay in getting the committee together, due largely to the special engagements of some of the members in Government service, on account of the war with Spain, your committee was finally organized with its present membership about two years ago, and immediately took up the work assigned to it with the corresponding committees of the American Railway Master Mechanics' and Master Car Builders' associations. It was found that the committees of these associations were also considering two other matters—viz., uniform pipe threads and standard square heads for bolts—and desired your committee to proceed with the active consideration of the subject of uniformity in the threads of coupling unions for pipe.

A careful examination of the dimensions of the threads in unions made by each of the principal manufacturers of these fittings showed that there were absolutely no two alike, and, further, that the other dimensions of the unions were so affected by the dimensions of the threads in the coupling nut that any successful attempt at uniformity in the threads must necessarily carry with it uniformity in so many of the other dimensions of the union itself that this committee would be obliged to take up not only the dimensions of the threads, but of the entire coupling union.

A careful study of the design of all makes of unions now commonly used was then made, for all sizes of pipe from ⅛ to 4 inches, inclusive. This investigation showed that no make of unions was sufficiently free from defects when critically examined in all sizes to warrant its adoption as a standard, even had it been considered desirable to do so; and your committee then decided to undertake the complete design of commercial sizes of malleable pipe unions for wrought iron pipe from ⅛ to 4 inches, inclusive, in order to get a design which we could indorse as consistent and submit as a proposed standard union. While this somewhat broadens the scope of your committee's work, it seemed the only practicable way to comply with our instructions.

The details of the design were worked out under the personal direction of Mr. Vogt of the committee, who has prepared the data, drawings and table of dimensions accompanying this report, as follows:

Fig. 1 shows a ¾-inch union, with all dimensions numbered for reference to the accompanying Table A.

Fig. 2 is a diagram of dimensions of the proposed standard pipe unions, and shows all dimensions plotted to an arbitrary scale, the vertical dimensions representing tenths of inches, the horizontal the outside diameter of the pipe.

Table A gives the dimensions of all sizes of unions from ⅛ to 4 inches, the figures at top of column referring to corresponding dimensions on Fig. 1. The description accompanying the table explains this table, and where any radical departure is made from present practice it is explained and the reasons given briefly.

It will be noted that all sizes from ½ to 4 inches have the pipe and swivel ends paneled where the pipe wrench engages. This paneling is not put upon the smaller sizes on account of the increase in size of the nut and dependent parts, necessitated by putting the ribs on the ends, nor is it considered at all necessary on these sizes.

The mark S on the side of the nut is suggested for a designating mark, which could be secured by this society if it is deemed wise to pursue such a course. The committee recommends that this be copyrighted and the standard unions thus designated.

Under date of March 16, 1901, your committee, having completed the design of proposed standard union, wrote the following letter to 11 of the principal manufacturers and dealers in malleable iron pipe unions, inviting them to favor the committee with any suggestions, criticisms or advice affecting these unions, either from the manufacturers' standpoint or the standpoint of the dealer or user of these devices. Two of those receiving such letters favored the committee with suggestions and criticisms which were all carefully considered, and the design, modified in the light of these suggestions, was again submitted to the same parties under date of November 8, 1901. To this communication, with the exception of acknowledgment of its receipt, no replies have been received.

Through the courtesy of Stanley G. Flagg, Jr., a number of ½ and 2 inch malleable unions have been made for your committee from patterns prepared from the designs for proposed standard pipe union. These unions have been tested to destruction, in two ways:

1. *Tensile Test.*—A round bar of iron, threaded with

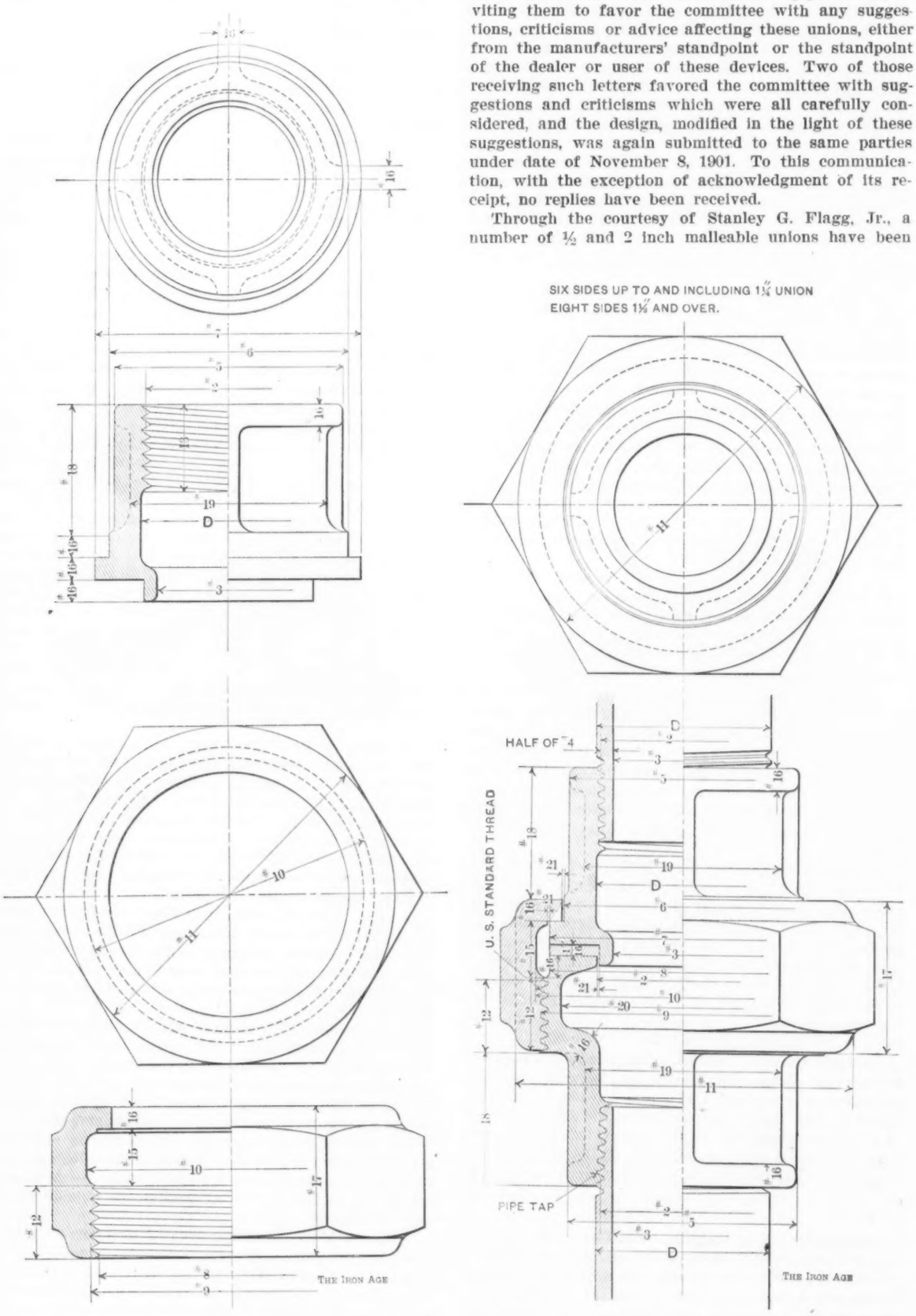
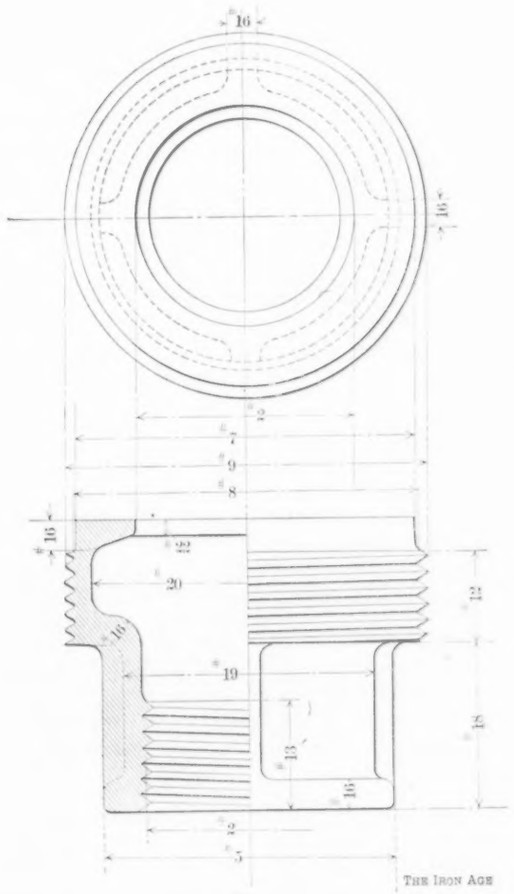



*Fig. 1.—A 3-Inch Union with all Dimensions Numbered for Reference to Table A.*

STANDARD PIPE UNIONS.

proper size pipe thread, was screwed into each of the unions, and a tensile strain was put upon it until rupture occurred. Where the casting was good the breakage generally occurred from the sharp corner under the collar on the nut, or under the collar on swivel, indicating that the uniformity in strength aimed at in the design was probably affected by the sharp corner left by finishing the bottom of the nut and the collar on swivel end. The strength seems ample, however, so no change in the dimensions is recommended. The average breaking stress of eight pieces, ½ inch, was 11,200 pounds, minimum 9850, maximum 12,080; of 2-inch, the average was 34,450 pounds, minimum 28,800, maximum 38,600.

2. *Transverse Tests.*—Made by screwing a round bar of iron, threaded as before, into each end of union nut, these bars being of sufficient length to be supported 11 inches either side of the center of the union, load




*Portion of Fig.* 1.

STANDARD PIPE UNIONS.

being applied on center of union nut. Breakage occurred at different points, indicating fairly uniform strength. The average breaking stress of three pieces, ½-inch, was 730 pounds, minimum 710, maximum 750; of 2-inch, the average was 7930 pounds, minimum 7800, maximum 8000.

Bursting tests were also made with ½ and 2 inch unions, by putting a pressure of water upon the union when fitted to piping. The pressure was gradually increased to 1200 pounds per square inch, the maximum obtainable, with no failure except some leakage under these pressures at the joint.

In order to secure and maintain the uniformity aimed at, if the report of this committee be adopted, it will be necessary to have standard gauges prepared for the finished parts—*i. e.*, the thread and collar of the nut, the external thread and finished parts of the nose piece, and the external finished portions of the swivel. The threads for pipe connections are already established standards recommended by this society, being the Briggs standard for pipe threads.

The results of our work have been communicated to the committees of the American Railway Master Mechanics' Association and Master Car Builders' Association from time to time, and your committee has been greatly aided by their assistance. We understand the designs submitted herewith will also be submitted to the railroad associations by their committees at their next meeting.

**Description Accompanying Table of Malleable Pipe Unions.**

Column No. 1 in table represents the nominal diameter of pipe.

Column No. 2 represents diameter of pipe at one-half the hight of full thread nearest solid section of pipe.

Column No. 3 represents the internal diameter of the pipe.

Column No. 4 represents the difference between Columns Nos. 2 and 3 and is equal to twice the thickness of metal in pipe measured from inside line to one-half the hight of thread, as specified before.

Column No. 5 represents the outside diameter of end of pipe union, and is taken as No. 2 plus twice No. 4 plus an arbitrary increment.

Column No. 6 is equal to No. 5 plus an increment varying from 0.04 to 0.07 inch. This increment was allowed for the purpose of being able to slip the nut over upper swivel end of union.

Column No. 7 is No. 6 plus an amount varying between 0.15 and 0.25. This lip created is considerably in excess of what exists on present pipe unions, for the reason that we find the surface between the lip and the corresponding part of nut is often damaged, and the bearing surface, when the full strength of the man is used on the wrench, is sufficient. We assume that a man would pull about 30 pounds on a wrench, with a possibility of using less force on pipes of small diameters. For that reason we made a variation in the width of the lip, which lip, theoretically, would be uniform for all sizes of pipe. The nut itself has been strengthened to prevent the lip from deflecting upward.

Column No. 8 is No. 7 plus an increment varying from 0.02 to 0.04 inch.

Column No. 9 is No. 8 plus twice the hight of the thread.

Column No. 10 is No. 9 plus an increment varying between 0.04 and 0.08 inch.

Column No. 11 is No. 10 plus one and one-half times No. 4.

Column No. 12 is two and one-half times No. 4, and was figured especially for bearing surface, so that the thread would not wear away too rapidly when the nut is occasionally removed.

Column No. 13 has been assumed arbitrarily, but in all cases is greater than the length of full thread on standard pipe.

Column No. 14 represents the number of threads per inch in length of nut. This thread, we believe, should be United States standard form and not sharp thread.

Column No. 15 is taken arbitrarily, but is based on the probable requirements of manufacturers for tapping out the nut.

Column No. 16 is three-fourths of No. 4.

Column No. 17 represents the full hight of nut and is equal to No. 12 plus No. 15 plus No. 16.

Column No. 18 is the amount of projection outside of nut.

Column No. 19 is No. 2 plus No. 4 plus an arbitrary increment.

Column No. 20 is No. 7 less No. 16, with slight modifications.

Column No. 21 represents the clearance at several points, as indicated on print.

Column No. 22 is assumed arbitrarily.

*Table A.—Dimensions for Proposed Standard Pipe Unions.*

| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|
| ⅛-inch | 0.375 | 0.270 | 0.105 | 0.59 | 0.63 | 0.78 | 0.80 |
| ¼-inch | 0.496 | 0.364 | 0.132 | 0.76 | 0.80 | 0.96 | 0.98 |
| ⅜-inch | 0.630 | 0.494 | 0.136 | 0.90 | 0.95 | 1.11 | 1.13 |
| ½-inch | 0.783 | 0.623 | 0.160 | 1.16 | 1.21 | 1.38 | 1.40 |
| ¾-inch | 0.992 | 0.824 | 0.168 | 1.38 | 1.43 | 1.61 | 1.63 |
| 1-inch | 1.246 | 1.048 | 0.198 | 1.74 | 1.79 | 1.98 | 2.01 |
| 1¼-inch | 1.592 | 1.380 | 0.212 | 2.12 | 2.18 | 2.37 | 2.40 |
| 1½-inch | 1.831 | 1.610 | 0.221 | 2.40 | 2.46 | 2.66 | 2.69 |
| 2-inch | 2.306 | 2.067 | 0.239 | 2.89 | 2.95 | 3.16 | 3.19 |
| 2½-inch | 2.775 | 2.468 | 0.307 | 3.39 | 3.45 | 3.67 | 3.70 |
| 3-inch | 3.401 | 3.067 | 0.334 | 4.07 | 4.13 | 4.36 | 4.40 |
| 3½-inch | 3.901 | 3.548 | 0.353 | 4.61 | 4.68 | 4.91 | 4.95 |
| 4-inch | 4.4 | 4.026 | 0.374 | 5.15 | 5.22 | 5.47 | 5.51 |

## The Pittsburgh Coal Company.

Last week the Pittsburgh Coal Company absorbed the plant and land of the Shaw Coal Company, located near Midway, in Washington County, Pa. The tract of coal land comprises 4200 acres, and the coal is of high grade and thin veined. At the same time the Pittsburgh Coal Company secured control of the Midway & Oakdale Railroad, owned by the Shaw Company, and leading from several of their mines to the Panhandle Railroad. The Shaw Coal Company were the principal competitors of the Pittsburgh Coal Company in the Panhandle district. On the Shaw Company's property are five openings, capable of producing 1,000,000 tons of coal a year. This makes the acquisition of this property by the Pittsburgh Coal Company a matter of great importance to the latter concern. The Pittsburgh Company already have large holdings in that section, which are fast being developed. More mines are also to be opened on the Shaw Company property.

John F. Atcheson of Pittsburgh, formerly identified with coke interests in the Connellsville region, is the president and general manager of the Shaw Company. The principal stockholder of the company is H. C. Frick. The company were organized about two years ago, and soon thereafter started to develop the coal properties they had purchased.

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It is reported that the Pittsburgh Coal Company will take over before long the Columbus & Hocking Valley Coal & Iron Company. The latter concern control almost the entire output of bituminous coal in the Hocking Valley, Ohio, and are a J. P. Morgan interest. The visit of a number of officials of the Pittsburgh Coal Company to the Hocking Valley recently has given rise to the report, which, however, has not been officially confirmed.

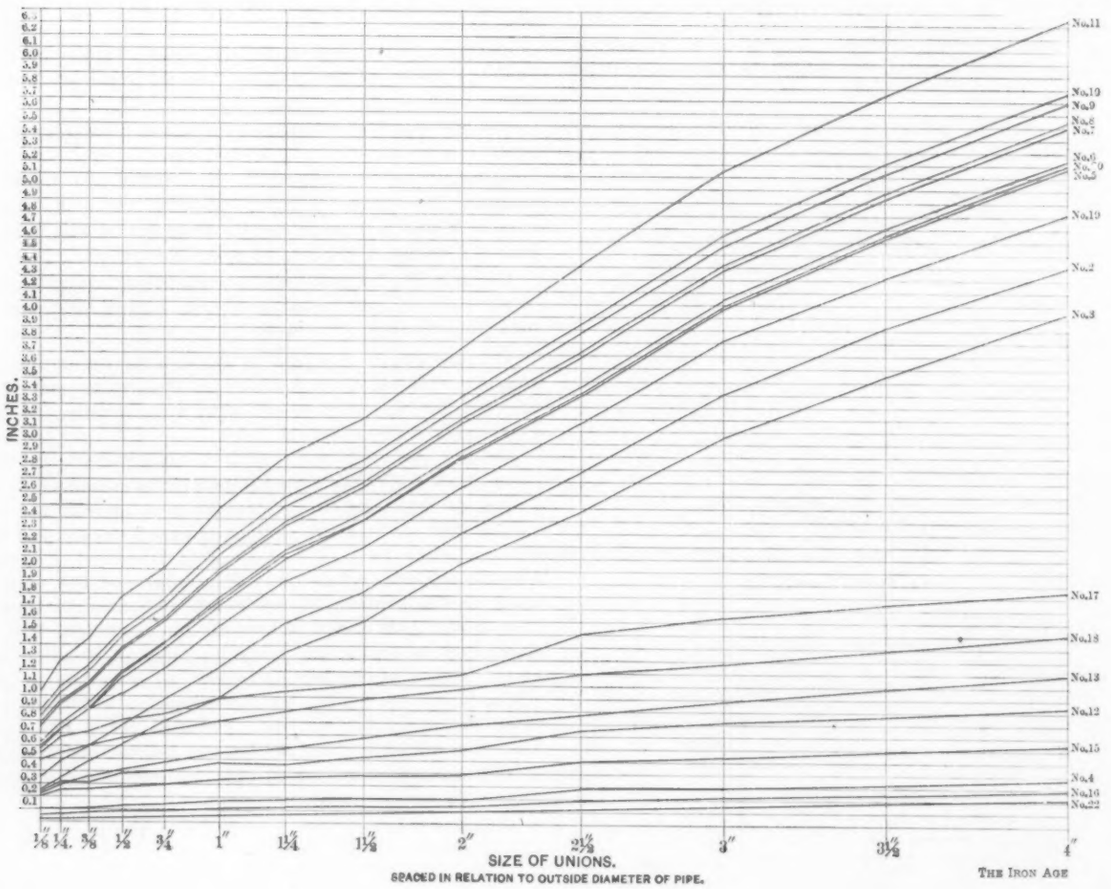


*Fig. 2.—Diagram of Dimensions of Standard Pipe Unions.*

STANDARD PIPE UNIONS.

| 1. | 9. | 10. | 11. | 12. | 13. | 14. | 15. |
|---|---|---|---|---|---|---|---|
| ⅛-inch | 0.85 | 0.89 | 1.05 | 0.26 | ¼ | 27 | 0.2225 |
| ¼-inch | 1.05 | 1.09 | 1.29 | 0.33 | 5-16 | 18 | 0.2625 |
| ⅜-inch | 1.20 | 1.24 | 1.45 | 0.34 | ⅜ | 18 | 0.2825 |
| ½-inch | 1.49 | 1.54 | 1.78 | 0.40 | 7-16 | 14 | 0.3025 |
| ¾-inch | 1.72 | 1.77 | 2.02 | 0.42 | ½ | 14 | 0.3225 |
| 1-inch | 2.13 | 2.19 | 2.49 | 0.49 | 9-16 | 11 | 0.3625 |
| 1¼-inch | 2.52 | 2.58 | 2.90 | 0.53 | 0.6 | 11 | 0.3825 |
| 1½-inch | 2.81 | 2.87 | 3.20 | 0.55 | 0.7 | 11 | 0.4025 |
| 2-inch | 3.31 | 3.38 | 3.74 | 0.60 | 0.8 | 11 | 0.4225 |
| 2½-inch | 3.86 | 3.93 | 4.39 | 0.77 | 0.9 | 8 | 0.5225 |
| 3-inch | 4.56 | 4.63 | 5.13 | 0.84 | 1.0 | 8 | 0.5625 |
| 3½-inch | 5.11 | 5.19 | 5.72 | 0.88 | 1.1 | 8 | 0.6025 |
| 4-inch | 5.67 | 5.75 | 6.31 | 0.94 | 1.2 | 8 | 0.6225 |

| 1. | 16. | 17. | 18. | 19. | 20. | 21. | 22. |
|---|---|---|---|---|---|---|---|
| ⅛-inch | 0.08 | 0.5625 | ½ | 0.59 | 0.615 | 0.006 | 0.05 |
| ¼-inch | 0.10 | 0.6925 | 9-16 | 0.76 | 0.76 | 0.006 | 0.06 |
| ⅜-inch | 0.11 | 0.7325 | ⅝ | 0.90 | 0.905 | 0.006 | 0.07 |
| ½-inch | 0.12 | 0.8225 | 11-16 | 1.03 | 1.20 | 0.006 | 0.08 |
| ¾-inch | 0.13 | 0.8725 | ¾ | 1.24 | 1.43 | 0.007 | 0.09 |
| 1-inch | 0.15 | 1.0025 | 13.16 | 1.565 | 1.76 | 0.007 | 0.10 |
| 1¼-inch | 0.16 | 1.0725 | 0.9 | 1.91 | 2.15 | 0.007 | 0.11 |
| 1½-inch | 0.17 | 1.1225 | 1.0 | 2.18 | 2.40 | 0.007 | 0.13 |
| 2-inch | 0.18 | 1.2025 | 1.1 | 2.66 | 2.90 | 0.008 | 0.14 |
| 2½-inch | 0.23 | 1.5225 | 1.2 | 3.16 | 3.41 | 0.008 | 0.16 |
| 3-inch | 0.25 | 1.6525 | 1.3 | 3.81 | 4.08 | 0.008 | 0.18 |
| 3½-inch | 0.27 | 1.7525 | 1.4 | 4.31 | 4.63 | 0.008 | 0.20 |
| 4-inch | 0.28 | 1.8425 | 1.5 | 4.81 | 5.19 | 0.008 | 0.22 |

## The Crane Company's Profit Sharing Plan.

On the evening of December 31 the Crane Company of Chicago for the third time distributed among their employees a large amount of money as a Christmas gift, in recognition of the services rendered, and with the desire of giving their workers some share, over and above their wages, in the splendid prosperity that has come to the company in the year just closed.

Every person in the employ of the company, 3500 men and women in all, received a sum equivalent to 5 per cent. of the money each has earned in 1901. No limit was put on length of service; men only a month at work got 5 per cent. of that month's wages. Fifty clerks worked for two weeks figuring out these percentages, and late in the afternoon the pay wagons were sent out to the different branches of the company at Judd and Twelfth streets, Jefferson and Van Buren, Jefferson and Randolph and Fulton and Desplaines.

For several days it had been rumored about the various plants that the company intended to take some action of this character, but nothing was definitely known among the great body of workmen till the whistles blew at 6 o'clock, giving the signal for the close of the last moment of work in the old year. The men were stopped as they were about to leave for home, and were told to file in to the paymasters' offices, where each received his handsome gift with its accompanying holiday wish. The average value of the Christmas box was $36, though many drew a great deal more than that.

At every one of the plants, for an hour after the close of work, hundreds of men stood about the gates and talked of the generosity of the company. The amount thus disbursed was about $125,000.

The Carnegie Steel Company have posted notices at their Duquesne Steel Works forbidding interference with employes because of religious or political beliefs, and stating that employees will be discharged for failure to pay their bills. Some of the rules posted are as follows: "1. No interference shall be permitted with the civil, religious or political opinions of any employee, and no political notices shall be posted in the works. 5. Any employee who is arrested for a criminal offense and leaves his position vacant thereby will be discharged. 6. Any employee who habitually neglects and refuses to pay his bills will be subject to discharge. 8. All superintendents and foremen must pay strict attention to the rights and privileges of the employees, and whenever a vacancy occurs, the employee of long service and in the line of promotion must be selected, regardless of his political or religious belief, providing he is able to fill the higher position." The other rules are relative to the care of machinery and the conduct of employees. Rule seven states that the use of intoxicating liquors while on duty is forbidden and renders the user liable to discharge.

## The World's Iron and Steel Trade.

Dr. H. Rentzsch of Dresden-Blasewitz, the statistician of the Verein Deutscher Eisen und Stahl Industrielle, has compiled some data bearing on the iron and steel trade of the world, which permit of some interesting comparisons. The following table deals with the production of the leading countries in 1900:

*The World's Production of Pig Iron.—Metric Tons.*

| | 1880. | 1890. | 1895. | 1898. | 1899. | 1900. |
|---|---|---|---|---|---|---|
| United States | 3,896,554 | 9,349,943 | 9,597,449 | 11,962,327 | 13,838,634 | 14,009,624 |
| Great Britain | 7,800,266 | 8,030,374 | 8,022,473 | 8,795,321 | 9,454,000 | 9,052,107 |
| Germany and Luxemburg | 2,729,038 | 4,658,451 | 5,464,501 | 7,312,766 | 8,142,017 | 8,520,390 |
| France | 1,725,293 | 1,962,196 | 2,003,868 | 2,525,075 | 2,567,388 | 2,699,494 |
| Belgium | 624,302 | 829,542 | 829,131 | 980,421 | 1,029,920 | 1,018,507 |
| Austria-Hungary | 750,134 | 945,775 | 1,025,047 | 1,350,696 | 1,427,000 | 1,475,000 |
| Russia | 448,411 | 926,482 | 1,452,380 | 2,222,469 | 2,783,208 | 2,925,600 |
| Sweden | 382,108 | 489,887 | 501,798 | 531,766 | 560,000 | 526,868 |
| Spain | 52,000 | 148,704 | 221,072 | 240,100 | 295,840 | 294,118 |
| Italy | 6,000 | 8,842 | 10,437 | 9,214 | 9,788 | 12,200 |
| Canada | 23,100 | 25,800 | 32,000 | 76,400 | 101,200 | 88,867 |
| Japan | 7,000 | 15,000 | 35,000 | 60,000 | 75,000 | 64,000 |
| Other countries | 40,000 | 70,000 | 80,000 | 100,000 | 110,000 | 150,000 |
| Totals | 18,484,206 | 27,460,996 | 29,275,156 | 36,166,555 | 40,393,995 | 40,836,775 |

It is estimated that the production of the world in 1800 was about 830,000 tons, that it reached 1,830,000 tons in 1830, about 4,800,000 tons in 1850 and 12,000,000 tons in 1870.

The consumption of pig iron in the leading countries is figured as follows, without reference to imports and exports of finished products or machinery:

*Consumption of Pig Iron in the Leading Countries in* 1900, *in* 1000 *Metric Tons.*

| | Production. | Imports. | Exports. | Apparent consumption. | Per capita consumption in kilos. |
|---|---|---|---|---|---|
| United States | 14,010 | 54 | 287 | 13,777 | 172 |
| Great Britain | 9,052 | 181 | 1,429 | 7,804 | 190 |
| Germany and Luxemburg | 8,520 | 727 | 129 | 9,118 | 163 |
| France | 2,699 | 172 | 137 | 2,734 | 70 |
| Belgium | 1,019 | 306 | 8 | 1,317 | 188 |
| Austria-Hungary | 1,475 | 74 | 23 | 1,526 | 33 |
| Russia | 2,926 | 526 | 3 | 3,449 | 26 |
| Sweden | 527 | 54 | 84 | 497 | 99 |
| Canada | 89 | 208 | 6 | 291 | 42 |
| Switzerland | 1 | 152 | 13 | 140 | 47 |

The "apparent consumption" is arrived at by adding production and imports and deducting exports, no account being taken of stocks.

Dr. Rentzsch has compiled the following table showing the development of the production of steel in the world:

*The World's Production of Steel.—Metric Tons.*

| | 1880. | 1895. | 1898. | 1899. | 1900. |
|---|---|---|---|---|---|
| United States | 1,287,983 | 6,312,074 | 8,970,772 | 10,709,209 | 10,689,640 |
| Germany | 624,418 | 2,830,468 | 5,734,307 | 6,290,434 | 6,645,869 |
| Great Britain | 1,341,690 | 3,365,109 | 4,638,345 | 4,933,010 | 4,904,232 |
| France | 388,894 | 714,523 | 1,441,633 | 1,529,182 | 1,660,118 |
| Belgium | 132,052 | 454,619 | 653,130 | 729,920 | 654,827 |
| Austria-Hungary | 134,218 | 330,000 | 860,000 | 950,000 | 945,200 |
| Russia | 295,568 | 574,112 | 1,153,000 | 1,250,000 | 1,830,260 |
| Sweden | 28,597 | 197,177 | 265,121 | 257,000 | 300,536 |
| Italy | ..... | 55,000 | 60,000 | 80,000 | 104,200 |
| Spain | ..... | 65,000 | 90,000 | 120,000 | 125,000 |
| Totals | 4,233,420 | 14,898,082 | 23,866,308 | 26,848,755 | 27,895,882 |

The figures for 1900 are not in all cases final, nor are all the data exact, because the statistics of the production of steel are not based upon the same complete methods in all countries.

The following table constitutes a highly interesting attempt to arrive at the consumption of iron and steel in

the leading countries. In a number of cases the calculations are approximate only because export and import statistics are only partly available by weight:

*Iron and Steel Consumption of Leading Countries in 1900, in 1000 Metric Tons.*

| | Germany. 1899. | Germany. 1900. | Great Britain. | France. | Austria-Hungary. | Belgium. | Sweden. | Italy. | Russia. | United States. |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of inhabitants, millions.... | 55.2 | 56 | 41 | 38 | 47 | 7 | 5 | 32 | 132 | 80 |
| Production of pig iron.....8,142 | | 8,520 | 9,052 | 2,699 | 1,475 | 1,019 | 527 | 12 | 2,926 | 14,010 |
| Imports: | | | | | | | | | | |
| 1. Pig iron and scrap..... | 677 | 827 | 181 | 317 | 91 | 368 | 54 | 358 | 53 | 88 |
| 2. Finished iron and steel, inclusive of machinery..... | 256 | 254 | 618 | 213 | 85 | 173 | 69 | 198 | 332 | 162 |
| Add 33 1-3 per cent. to reduce to equivalent of pig iron.... | 85 | 85 | 206 | 71 | 28 | 58 | 23 | 66 | 111 | 54 |
| Total imports.....1,018 | | 1,166 | 1,005 | 601 | 204 | 599 | 146 | 622 | 496 | 304 |
| Total production and imports.....9,160 | | 9,686 | 10,057 | 3,300 | 1,679 | 1,618 | 673 | 634 | 3,422 | 14,314 |
| Exports: | | | | | | | | | | |
| 1. Pig iron and scrap..... | 259 | 190 | 1,524 | 480 | 38 | 52 | 90 | ... | ... | 335 |
| 2. Finished iron and steel.....1,471 | | 1,589 | 2,321 | 142 | 138 | 683 | 217 | 42 | 4 | 903 |
| Add 33 1-3 per cent. to reduce to equivalent of pig iron.... | 490 | 530 | 774 | 47 | 46 | 228 | 72 | 14 | 1 | 301 |
| Total exports.....2,220 | | 2,309 | 4,619 | 669 | 222 | 963 | 379 | 56 | 5 | 1,539 |
| Home consumption.....6,940 | | 7,377 | 5,438 | 2,631 | 1,457 | 655 | 294 | 578 | 3,417 | 12,775 |
| Consumption per capita, kilos..... | 125.7 | 131.7 | 132.6 | 69.3 | 31.0 | 93.6 | 58.8 | 18.1 | 25.9 | 159.7 |
| Home production per capita, kilos.. | 147.5 | 152.1 | 220.8 | 71.0 | 31.4 | 145.6 | 105.4 | 0.4 | 22.2 | 175.1 |

It will be observed that Dr. Rentzsch places the population of the United States in 1900 at 80,000,000, which is a little high, and that therefore the per capita consumption of this country, figured at 159.7 kilos, or 350 pounds, is rather low. As it is, it is considerably above that of any other country.

## The Worcester Polytechnic Institute.

WORCESTER, MASS., January 6, 1902.—The Worcester Polytechnic Institute has received a gift of $30,000 from four of the Worcester trustees of the institute: Charles H. Morgan, president of the Morgan Spring Company and Morgan Construction Company; Charles G. Washburn, president of the Washburn Wire Company of Providence and New York, and of the Worcester Wire Goods Company; Hon. Stephen Salisbury and G. Henry Whitcomb, formerly head of the Whitcomb Envelope Company. The object of this gift is to increase the equipment of the institute, particularly by the erection and equipment of a new building, to be devoted to a foundry and forge shop. The building iself will cost $10,000, and the cost of equipment will be considerably more.

The shops of the institute are conducted on a very practical basis, to give the students of the mechanical course actual practice in all branches of mechanical work, and the foundry and forge shop turn out work used in the building of machinery in the Washburn shops. The present foundry is inadequate to supply the demands of the shop, and also to permit of the practice of whole divisions of students at one time. The same is true of the forge shop, where students are given a good deal of practical work in forging and blacksmithing. The new building will be a source of economy in shop production, as much of the casting is now done in city shops; it will add to the advantages received by students, and will make pleasanter other buildings, which now suffer from gases from furnace and forges.

The trustees of the institute are to attempt the raising of a large endowment fund, in co-operation with the alumni, who have expressed a desire to help along the work in every way in their power. The income of the institute is not sufficient at the present time, and the trustees have gone deep into their pockets from time to time to help out. Mr. Salisbury has given several large sums for the purpose, one such gift being for $10,000. The new president of the institute, Dr. E. A. Engler, formerly of St. Louis, who succeeded Dr. Thomas C. Mendenhall, is to take an active part in this raising of funds.

**The Standard Steel Car Company.**—The incorporators of the Standard Steel Car Company of Pittsburgh have received their charter and will proceed at once with the organization of the company. The capital stock is $3,000,000, and J. M. Hansen, who was formerly chief engineer of the Pressed Steel Car Company, is president of the Standard Steel Car Company. The designs for the buildings and the machinery for the new plant, which will be built in the Pittsburgh district, are nearly completed and work on the buildings will be started before long. Some of the equipment has already been ordered. The company hope to be turning out steel cars in August or September of this year. A. R. Fraser, formerly treasurer of the Pressed Steel Car Company, is connected with the Standard Steel Car Company in a similar capacity. P. F. McCool is general superintendent of the new concern.

## The United States Steel Corporation in the Pocahontas Field.

Judge E. H. Gary of the United States Steel Corporation has given out the following official statement:

The properties heretofore secured by the managers of the Pocahontas Coal Syndicate, consisting of about 300,000 acres of the very best fuel and coking coal which has ever been discovered, and located on the lines of the Norfolk & Western Railway Company, have been sold and conveyed to the Pocahontas Coal & Coke Company, whose capital stock is owned or controlled by the railway company. Of these lands, 50,000 acres have been leased, on a royalty basis, to companies whose capital stock is owned or controlled by the United States Steel Corporation. There will, within the comparatively near future, be constructed at least 3000 of the most modern coke ovens, with a capacity of at least 1,500,000 tons of coke, together with necessary railroads, tipples, water works, electric plants, power plants, residences, stores and other improvements. Work will be commenced at once.

It is expected that the consummation of these transactions will result in great benefit to the Norfolk & Western Railway Company and to the interests of the United States Steel Corporation. Although the royalties are small, they are largely in excess, per acre, of the purchase price with interest, so that the business of the coal company should be very profitable; and the freight receipts for transporting the coke to be produced, as well as a large tonnage for coal for fuel, should furnish a very large and steady and increasing income to the railway company. The companies controlled by the United States Steel Corporation have by this lease secured, at a low royalty charge, sufficient coal of the best character and quality to provide, on the present basis of consumption, for about 30 years. This, with the Connellsville coal now owned, will, on the same basis, furnish the necessary supply of coke for upward of 60 years; and it now corresponds with the iron ore supply.

Pocahontas coal is very high in carbon, of good physical structure for coke, practically smokeless, and the demand for this coal, for fuel and coke both, has been steadily growing, and at present greatly exceeds the supply.

# The Iron Age

**New York, Thursday, January 9, 1902.**

DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - BUSINESS MANAGER.


## The Iron Age Index.

The Index to the reading matter of Volume LXVIII of *The Iron Age*, for July 1, 1901, to January 1, 1902, is now from the press, and will be mailed to those subscribers of *The Iron Age* who will make application for it.

In order to relieve those who bind or file *The Iron Age* of the trouble of future applications for the semiannual Index, we have a special list to whom in the future the Index will be forwarded without further notice. Those who are now entered have had the Index mailed to them.

## Our Foreign Trade Balance.

The veracity of figures is proverbial; but figures sometimes convey misleading impressions when not perfectly understood. For example, it was discovered a few years ago that the report of the Manhattan Elevated Railway system in this city showed that the annual movement of passengers south exceeded by a very large number—nearly 200,000 we believe—the annual movement north. The statistical inference from this was that somewhere in the lower part of Manhattan Island people were accumulating at a rate which must soon produce an intolerable congestion. It was impossible to learn from inquiry that they returned in any way, every other avenue of travel carrying more people south every day than it carried north. There was no congestion observable in the district below City Hall, but the fact appeared to be indisputable that the northern end of Manhattan Island was being depleted of population, while the lower end was filling up in a way suggesting curious speculations as to where the added population could possibly find accommodation. Probably this process has been going on ever since, and for an explanation of the phenomenon we must look outside the figures which establish it.

We are reminded of this amusing statistical paradox by the worry created by the fact that for some years the balance in favor of the United States in international trade has been so large as to seem to threaten bankruptcy to the nations trading with us. We have purchased relatively so little, and sold them relatively so much, that in the ultimate settlement we must find ourselves a creditor for such sums as would suggest to the debtor nations the advantage of placing themselves in the hands of receivers for the protection of all in interest. Anxiety on this score has not been confined to the economists of Europe. Our own statisticians have worried over the problem and lost much sleep in trying to figure out where the gold to settle our credit balances was to come from, and what would be the condition of the financial markets of Europe when we got what was due to us. It was suspected that there was a liquidation going on in some mysterious way which could not be traced through the ordinary channels of exchange, but for the reason that it could not be traced and that, so far as official statistics showed, we were piling up a ruinous credit balance against Europe, it has caused much anxiety on both sides of the ocean. During the past four years we have been selling to the nations more or less depending upon us for food and raw materials, as well as for certain forms of manufactures, to the average value of about $590,000,000 net, annually. During the past two and a half years our merchandise balance on exports in excess of imports has amounted to about $1,510,000,000; and yet within the past two months we have been called upon to furnish Europe many millions in gold. How is this?

In an article of great statistical and analytical value contributed to the New York *Times*, Nathaniel T. Bacon undertakes to solve this economic riddle, and comes nearer to an intelligible and satisfactory explanation of it than has yet been offered. His discussion of the subject is much too voluminous to be followed in detail, but his conclusions from a thorough study of the subject are of sufficient interest to challenge the attention of all for whom it has interest. Of course his estimates are professedly approximate only, and we miss in his memoir the frank admission which ought to be made that our import and export statistics are not by any means accurate.

From 1860 to about 1893 this country borrowed heavily from Europe. Our rapid internal development was largely dependent upon the sale of our securities abroad. The tide set strongly the other way in 1897, and since that year our great prosperity has enabled us to pile up what appear to be the enormous foreign credits which are regarded with some apprehension by the debtor nations. The period between 1893 and 1897 was one of extensive liquidation. European creditors were distrustful of the security of their investments, and to keep our credit good we had to take large volumes of the securities offered us. This, as Mr. Bacon shows, was an operation involving a great many sacrifices, but the economies it enforced were the source of permanent advantage. During this period every effort was made to minimize the cost of production. Working on a really narrow margin was a new thing in the experience of most American manufacturers; but the lesson was extremely useful, and when the full tide of prosperity returned in 1897 we were in position to take advantage of it. We were also able to redeem with very little inconvenience the large amounts of our securities surrendered in some alarm by foreign holders frightened by the prospect of the election of Bryan to the Presidency and the repudiation by the country of every sound principle of national finance. As the result of the distrust which had imposed so many sacrifices we found ourselves better equipped to take advantage of the opportunities offered us in the open markets of the world than any other country, and because of this advantage our export trade has experienced the immense expansion which has produced such consternation in Europe. The actual movement of foreign trade and exchange since July 1, 1899, reveals the fact that we had, up to November 1, 1901, exported general merchandise up to the value of about $1,385,000,000, over and above the value of our imports; we also exported a net balance of about $55,000,000 of silver, and imported a net balance of $30,000,000 of gold. This makes a credit to be accounted for of $1,410,000,000, to which November and December probably added another hundred millions. This is a large sum, and would undoubtedly produce serious disturbance in the money markets of Europe if it was not liquidated in some way which passes the custom house unnoticed and escapes identification in Government statistics.

Primarily, we have an annual interest account to set-

tle, which, under present favorable conditions, is probably not far from $200,000,000. This is larger now than it was during the years when the general business of this country was less profitable than it is at present. The expenses of American travelers, and of citizens more or less continuously residing abroad, are estimated at $50,000,000, and money taken out of the country by persons returning to their native places after a longer or shorter residence here is put at $10,000,000. If for all of these items we assume a total of $250,000,000 since July 1, 1899, we probably shall not be seriously in error. Mr. Bacon estimates that for the past two and a half years the money which has left the country on account of the causes noted is not far from $450,000,000. A large item which has generally escaped attention is our naval and military expenses in foreign parts. Cuba, China and the Philippines will at once suggest themselves as offering opportunity for the expenditure of a great deal of money in ways looking to the indirect liquidation of our credit balance with other countries. Wherever our ships go they of necessity spend a good deal of money in buying things which help to swell the debit side of our foreign account. Money sent from this country by prosperous immigrants to poor and dependent relatives in Europe also amounts in good years to a large but indeterminate total. Incidentally, gifts for educational and charitable purposes and for missionary work amount to considerable. Mr. Carnegie alone has given of money earned in this country and representing American capital nearly $12,500,000. Peter's pence, Indian famine relief subscriptions and other gifts and benefits, including aid for the Boers, together amount to probably $10,000,00 per year, or $25,000,000 for the past two and a half years. Theoretically, these large sums are sent from this country in money; practically, they are so handled through the international banking institutions that an equivalent amount of money which would come here does not come, but is retained for employment by the debtor nations. The sum of the items above estimated is approximately $515,000,000 for the past two and a half years, leaving, say, $885,000,000 of the apparent trade balance still to be accounted for. Mr. Bacon accounts for it partly by American investments abroad.

The extent of the operations carried on with American capital in other countries is likely to escape attention.

Mr. Bacon estimates that our investments abroad since July 1, 1899, have amounted to $75,000,000 for Canada, $50,000,000 for Mexico, $25,000,000 for other continental America, $25,000,000 in the West Indies, $50,000,000 in England, $10,000,000 on the European Continent, $5,000,000 in Africa, $10,000,000 in Asia, and $15,000,000 in the Philippines.

We have also taken considerable blocks of foreign bonds. Some of these have been returned instead of gold within the past few months, but it is assumed that our net holdings at the present time are not far from $75,000,000, not including the $20,000,000 of Chinese indemnity bonds held by the Government. Attention should also be given to the fact that very large amounts of insurance capital have been invested in the forms of securities prescribed by foreign governments for the protection of their European risks.

The most important offset to the apparent adverse trade balance which has so worried the economists has been the repurchase of American securities held abroad. Northern Pacific alone has stood for redemptions of probably $75,000,000. The securities of the Chicago, Milwaukee & St. Paul and of Chicago, Burlington & Quincy have also been repurchased in large amounts as an incident of the recent struggle for control between the Great Northern and the Northern Pacific syndicates. Stocks of the New York Central and the Pennsylvania railroads have also been largely repurchased. Mr. Bacon thinks that within the past two and a half years as much as $400,000,000 of American securities have been returned for one reason or another. Probably this buying back of our securities has gone a long way to liquidate the balance due us on excess of exports over imports. Our present net indebtedness to Europe on investment account is assumed to be about $1,700,000,000. At the rate of present progress in liquidation this should be extinguished in about five years. It is doubtless less than this by a pretty wide margin if, against the foreign capital employed here, is offset the American capital invested abroad; but for purposes of trade balance liquidation we still have something like $1,700,000,000 to draw upon.

Mr. Bacon presents the following tentative exposition of the general balance of trade since July 1, 1899, as showing what has absorbed the trade balance of $1,510,000,000 for that period:

| | |
|---|---|
| Non-remunerative: | |
| Balance of interest | $250,000,000 |
| Travelers and expatriations | 200,000,000 |
| Military expenditures outside the United States | 150,000,000 |
| Gifts | 25,000,000 |
| Investments abroad: | |
| In Canada | 75,000,000 |
| Mexico | 50,000,000 |
| Other Continental America | 25,000,000 |
| West Indies | 25,000,000 |
| England | 50,000,000 |
| European Continent | 10,000,000 |
| Africa | 5,000,000 |
| Asia | 10,000,000 |
| Philippines | 15,000,000 |
| Foreign bonds placed in America | 95,000,000 |
| Repurchase of American securities: | |
| C., B. & Q., N. P. R. R., C., M & St. P. R. R. | 125,000,000 |
| Balance of other securities and loans | 400,000,000 |
| Total | $1,510,000,000 |

The net conclusion from this instructive study of the subject of our foreign trade balances seems to be that during the existing period of prosperity we have been able to pay not only the interest on our foreign indebtedness, but a considerable part of the principal as well, and that by reason of such reductions we have maintained an enormous excess of exports over imports without producing any of the evil results assumed to be inevitable as the consequence of such a condition of affairs. How long this state of things can go on without depleting the gold supply of Europe to purchase American food products and other things of which our neighbors have need is a matter of judgment. Probably the expected will never happen.

## Labor in the Butte Copper Mines.

One phase of the great copper mining industry of the United States has never been given the attention by the metal trade which it deserves, because the conditions have become almost chronic. Yet the day may come when it will play a very important part in the course of events in the metal markets. For many years Butte, the greatest copper camp of the world, has been completely under the control of the miners' union, which has practically dictated not only to the local mining companies, but has also been behind the men who committed outrages again and again in the Cœur d'Alene district of Idaho. The false position in which the men stand to-day is primarily due to the course taken by mine managers, who were willing to sacrifice everything to political preferment. So long as copper was high and earnings were enormous there was no thought of bringing about reforms. But with a demoralized market a reduction of labor cost may become

necessary. No one supposes that any one will dare to propose a reduction of wages, but it may be found that with copper selling as cheap as or even cheaper than it is now the mines may not be run to full capacity, and the force of men may be cut down very materially. We may find, therefore, that for a considerable time to come Butte will not produce as heavily as it could, as a preliminary to a readjustment of the relations between the mining companies and the men.

## Commendable Fruits of Prosperity.

It is exceedingly pleasant to note many manifestations of a disposition among employers to permit their men to share in the profits of this period of prosperity. Our columns present some striking evidences of the kindliness of manufacturers in rewarding their employees for their services by giving them a share of the profits or other testimonials indicating their interest in the welfare of their men. In some instances, as in the case of the Crane Company of Chicago, this has taken the form of a percentage of the wages received during the year. This is an equitable method of remembering employees, as they thus share in the profits of the company in proportion to the value of the services rendered. In other cases gratuities of various amounts have been made which are based on the length of service or some other consideration deemed a proper basis. It is believed that never before in the history of the country has the disposition been so general among employers to remember their workmen with substantial evidences of good will and esteem. The instances which are brought to the attention of the public must necessarily represent only a small percentage of the actual occurrences of this character. For special reasons numerous employers prefer not to make matters of this kind public. It is therefore possible that the dispensing of gifts at the recent holiday season has been the rule, and that the generous employers have not been rare exceptions.

The conditions now prevailing through the country are such as to afford ample employment to all who are desirous of earning a living. This is shown by the difficulty encountered at numerous points in securing a sufficient force of workmen to perform labor of an irregular character. Municipalities have been for some time decidedly hampered in street cleaning and other municipal work by the scarcity of available men. The floating working population have very largely found regular employment in manufacturing operations, or in connection with improvements of all kinds now undertaken by railroad companies and other semi-public or private corporations. This condition has enabled workingmen to receive far better wages than the average obtained during the long period preceding the present era of activity. It should bring about a more general feeling of contentment and satisfaction, but this feeling is greatly promoted by evidences of special interest in the welfare of employees when times are exceptionally propitious. The workmen who are so fortunate as to have secured regular employment and at the same time have found service with employers who feel that they should share their prosperity with their employees are thus reaping a double return for the good times which we are now enjoying. If these times could be perpetuated we feel sure that the disposition to be liberal would not only continue and become a permanent feature of the relations between employer and employed, but would also eventually grow to become part of the policy of every great manufacturing company. There are lines, of course, in which profits are on a uniformly moderate basis and employers are often strained to their limit in paying prevailing rates of wages. It is therefore impossible to expect the profit sharing idea to become universal.

One of the interesting announcements made at this time is that just issued by the American Steel & Wire Company. The officers of this company have taken steps to establish a pension department for the support of employees who have rendered the company long and faithful services and have attained an age or physical condition which necessitates a relief from duty. This is a particularly meritorious arrangement, as it does not contemplate the establishment of a pension fund derived from payments by employees, but will be wholly sustained by the company. It therefore differs from the system of pensioning adopted by railroad companies. It is an excellent example for other large manufacturing companies to follow. We are aware that it has long been the policy of numerous manufacturers to keep their old or incapacitated employees on their pay rolls, giving them duties suited to their age or condition, instead of turning them out to be at the mercy of the world and perhaps become objects of charity. This policy, however, is not usually carried out on a systematic plan. Therefore the action taken by the American Steel & Wire Company represents a decided improvement on what may have heretofore been done in this direction. It is an admirable idea to bring out this plan at the present time as one of the features of this era of prosperity.

The liberal tendency of employers as indicated by their action in these respects should go far toward establishing more friendly relations between capital and labor. If labor finds that it is remembered in times like these and given some share of the profits, the spirit of discontent, which is the prolific cause of dissension and disagreements, will be greatly allayed. It will not bring about the millennium, but will certainly have a good effect in preserving friendly relations.

The late Mr. Greeley is credited with saying that the way to resume specie payments during a suspension of them was to resume, and this seems to apply to some labor controversies. The British Westinghouse Company have, as is well known, erected enormous works in England, and before they were undertaken consulted with local builders as to the time they would engage to have them ready for occupation. Various estimates were given, the average being about five years. This was quite out of the views of the American managers of the enterprise, and they undertook to do it in a much shorter time. The bricklayers' union was consulted first, and they seemed to thiuk that the solution of the matter laid wholly with them, as it did, if the rate at which they worked had been tolerated; they did about half a day's work for a whole day's pay, with results that need not be enlarged upon further. The union rate of pay per hour was about 40 cents, but the American managers increased this voluntarily to 42 cents, but demanded that the rate of laying should be raised at once from 800 or 900 bricks per day to 1800 bricks per day, with the ultimatum that in case of refusal by the union they would hire nonunion men and do the work themselves. After humming and hawing over the question for a certain time the proposition was accepted and the buildings were put up inside of a year. It is too much to expect that this will serve as an illustration that some things can be done as well as others, but it should have its effect nevertheless.

## CORRESPONDENCE.

### Standard Dimensions for Roller Chains.

*To the Editor:* We have adopted a standard of dimensions for each roller, bushing and rivet in proportion to the pitch and width of each chain we manufacture. Expert tests and scientific reports demonstrate that these dimensions are theoretically and practically correct. They show, further, that the quality of material used in chain construction is quite as important as the dimensions and workmanship.

The primary difficulties in chain transmission of power arise from elongation of pitch. Sprockets will not wear if the pitch of chain remains perfect. Elongation of pitch from wear occurs first at the inner parts, in proportion to the working load and size of sprocket. Life in this case depends largely on the quality of material and the hardness of the bearing surfaces. To a great degree is elongation due to stretch, or fatigue of material. Bending of the rivet most frequently leads to elongation and constant wear. Shearing or flattening of the rivet by the side plate is another common cause of elongation. So also is the compression of the material in the side plate and the consequent elongation of the hole in same.

After securing the proper proportions for a given pitch which considers the size of tooth and the correct shape of same to engage properly, it is necessary to bring the component parts to the point of highest efficiency. Our experience from numerous physical tests has developed the fact that only the very highest grade of steel will withstand the strain imposed, and, further, that the most disastrous results occur from the bending and compression of the rivets. To overcome this trouble we find, after experimenting with many analyses of Bessemer as well as tool steel, that it is absolutely necessary to use only the very best grade of nickel steel for the purpose. The securing of a proper analysis in this steel has required unremitting efforts covering a period of over 18 months, resulting in the discovery of what proves to be the best, most efficient and likewise the most expensive material ever used for the purpose.

A further requisite is the proper treatment of this steel to produce a hard wearing surface, and yet have the body of the rivet sufficiently soft to enable us to rivet the ends, driving them solidly into the side bars. The proper and uniform treatment in this direction can only be accomplished by the scientific application of pyrometry, our equipment in this line being most elaborate.

Our dimensions have been adopted by practically all large manufacturers abroad. American manufacturers are rapidly changing their construction to conform to our dimensions.

We wish to bring this very important subject to the attention of engineers generally, for the reason that frequent efforts are made by the inexperienced undertaking to establish a standard in dimensions which do not harmonize with those generally used.

L. M. WAINWRIGHT,
Manager Diamond Chain Factory.

INDIANAPOLIS, January 4, 1902.

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At Pittsburgh, James McNeil & Brother, operating a boiler works in that city, have sued the Crucible Steel Company of America for $75,000 damages, as a result of the explosion at the works of the Park Steel Company on December 20 last. The plaintiffs claim $50,000 damages for the destruction of their buildings, material and appliances; $5000 because of the loss of their plant, and $20,000 for the increased cost of filling contracts.

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The third and partial account of the surviving trustee of Nimick & Co. of Pittsburgh was filed in the courts in that city last week. It shows there is $26,990.96 to be distributed among claims aggregating $155,882.96 to creditors holding Kemble Iron Company paper. The report also shows there is $121,957.27 general assets to be distributed among creditors whose claims aggregate $333,244.04.

## The Prospects for Reciprocity.

WASHINGTON, D. C., January 10, 1902.—Two important developments will probably occur within the next 30 days that will shed considerable light upon the question as to whether the Fifty-seventh Congress will take any decisive action looking to the adoption of any form of reciprocity policy. The first of these will be an effort which those taking part in it expect will prove successful, to secure a favorable report from the Senate Committee on Commerce of Senator Nelson's bill establishing a Department of Commerce, the head of which shall be a member of the President's Cabinet. The second will be an attempt on the part of Senator Cullom, the newly appointed chairman of the Senate Committee on Foreign Relations, to induce his committee by a direct vote, either favorable or adverse, to report the pending recoprocity treaties to the Senate.

### A Department of Commerce.

Senator Nelson has carefully revised the bill establishing the proposed Department of Commerce, and asserts that he has ample assurances that the Commerce Committee will report it on a very early date. It will be remembered that a similar measure, drafted by Mr. Nelson, was favorably reported in the last Congress, but failed of consideration for lack of time and because of the protracted contest over the Ship Subsidy bill, which was reported from the same committee. The organization of the new department is outlined in section 4 of the new bill, as follows:

"That the following named officers, bureaus, divisions and branches of the public service, now and heretofore under the jurisdiction of the Department of the Treasury, and all that pertains to the same, known as the Life Saving Service, the Light House Board and the Light House Service, the Marine Hospital Service, the Steamboat Inspection Service, the Bureau of Navigation and the United States Shipping Commissioners, the Bureau of Immigration, the Bureau of Statistics and the United States Coast and Geodetic Survey, be, and the same hereby are, transferred from the Department of the Treasury to the Department of Commerce, and the same shall hereafter remain under the jurisdiction and supervision of the last named department, and that the office of Commissioner of Railroads, the Census Office, the Patent Office and all that pertains to the same, be, and the same hereby are, transferred from the Department of the Interior to the Department of Commerce, to remain henceforth under the jurisdiction of the latter; that the Department of Labor and the office of Commissioner of Fish and Fisheries and all that pertains to the same, be, and the same hereby are, placed under the jurisdiction and made a part of the Department of Commerce; that the Bureau of Foreign Commerce, now in the Department of State, be, and the same hereby is, transferred to the Department of Commerce and consolidated with and made a part of the Bureau of Statistics, hereinbefore transferred from the Department of the Treasury to the Department of Commerce, and the chief of said Bureau of Foreign Commerce shall be the assistant chief of the said Bureau of Statistics; and it shall be the duty of said bureau, under the direction of the Secretary, in addition to the duties now prescribed by law, to gather, compile, classify and publish statistical information showing the condition of the foreign and domestic commerce, of the mining, manufacturing, shipping, and fishery industries, and of the transportation facilities of the United States."

### A Bureau of Manufactures.

The most important bureau in the proposed new department will be known as the Bureau of Manufactures, the province of which shall be "to foster, promote and develop the various manufacturing industries of the United States and markets for the same at home and abroad, domestic and foreign, by gathering, compiling, publishing and supplying all available and useful information concerning such industries and such markets and by such other methods and means as may be prescribed by the Secretary or provided by law. And all consular officers of the United States, including consul-

generals, consuls and commercial agents, are hereby required, and it is made a part of their duty, under the direction of the Secretary of Commerce, to gather and compile, from time to time, useful and material information and statistics in respect to the commerce, industries and markets of the countries and places to which such consular officers are accredited, and to send reports quarterly, or oftener if required, of the information and statistics thus gathered and compiled to the Secretary of the Department of Commerce."

The suggestion is now being very strongly urged that in the event that the pending reciprocity treaties are rejected, either in committee or in the Senate, the functions of Bureau of Manufactures of the projected department shall be enlarged so as to embrace the duties which it has been proposed to assign to a reciprocity commission. This suggestion is based to some extent upon the recommendations of the National Reciprocity Convention, held in Washington last November, which it will be remembered advocated, first, the appointment of a special commission to have charge of the subject of reciprocity, and second, the creation of a Department of Commerce with a special bureau which should ultimately take over the duties and responsibilities of the reciprocity commission. It is maintained by the friends of this project that Senator Nelson's bill would require only slight amendments to enable it to meet fully the ideas embodied in the resolutions adopted by the convention. It is also urged that many who heretofore have opposed the plan of a reciprocity commission as unlikely to bring about results of value would be found to favor strongly the authorization of a special bureau in a Department of Commerce charged with the same work. Senator Nelson is very enthusiastic in discussing the outlook for the passage of his bill, and points with no little pride to the strong indorsement given his project by President Roosevelt in his recent message to Congress. Mr. Nelson hopes to see his bill reported within the next three weeks, and he will ask for its consideration on the floor of the Senate as soon as possible thereafter.

### The Reciprocity Treaties.

Senator Cullom proposes to bring the reciprocity treaties to the attention of the Foreign Relations Committee within the next fortnight, and although he has no reliable data indicating the probable action of the committee beyond what it has done in the past, he will ask for a formal vote without further delay. With regard to his own attitude on the subject of the treaties Senator Cullom says:

"These treaties are in line with the suggestions of the late President McKinley just before his death. While we are doing our best to make commercial progress, we want to recognize that other people have the same right as ourselves to do the best they can. Only a short time before President McKinley left Canton to go first to Cleveland and then to Buffalo I visited him and talked with him on this very question. Asking whether he thought we ought to revise the tariff in the usual way or carry out some kind of reciprocity or commercial treaty system, he said by all means we ought not to revise the tariff this year, but we ought to adopt the other plan as far as we could do so consistently. I have thought for a year or two that if we do not take up the tariff for the purpose of a revision in the regular way we ought to do something in the way of securing commercial treaties looking to a modification of the tariff in particular cases. I am in favor of general reciprocity in such a way as not to interfere with the general principle of protection. I think it would be a great misfortune to the country for us to take up the tariff for general revision this year. It would disturb our business interests and manufacturers would hesitate to go forward with their work in view of the uncertainty that would exist, and we would find ourselves involved in trouble. But we can accomplish desirable ends by means of reciprocity and commercial treaties without seriously disturbing the business interests of the country."

Senator Cullom is not sanguine that the committee will take favorable action on any of the pending treaties, but he desires to have them disposed of in order that the way may be open for the development of a reciprocity policy in some other manner. He feels that as long as the treaties are pending and are not acted upon it will not be possible to make progress in any other direction.

The published declaration of Gov. Leslie M. Shaw, who will succeed Mr. Gage as Secretary of the Treasury about February 1, that we must look for a change in the character of our foreign trade, and that we cannot continue to receive our own securities from abroad in settlement of the large balance in our favor, is received here with many expressions of gratification by the advocates of a more liberal policy of reciprocity than that recommended by the recent national convention. Governor Shaw's recognition of the necessity of buying from our best customers if we are to continue to increase our foreign trade is pointed to by the champions of reciprocity as a very hopeful sign and it is asserted that his entrance into the Cabinet will have an important influence "in arousing the administration to a keen sense of the dangers which now menace the American export trade."

### Advocating Reciprocity.

While the conclusions reached by the National Reciprocity Convention had a very depressing effect upon the friends of the pending treaties and upon those who hoped that a new basis for the negotiation of other treaties would be suggested, there have been many indications since Congress convened that the subject cannot be considered as disposed of. Petitions and memorials have begun to reach both Houses from all sections, some of which urge the ratification of the pending treaties, while others favor in general terms the adoption of a reciprocal trade policy to be invoked in our dealings with all nations with which satisfactory agreements can be made. Senator Teller of Colorado recently filed an urgent petition of business men of his State asking the ratification of the French treaty, and voluminous petitions drafted for the same purpose have been presented by Representatives Goldfogle of New York and Graham of Pennsylvania. Senators Hale and Frye of Maine have been flooded with demands for the negotiation of a reciprocity treaty with Canada, and petitions representing several hundred business men of Portland and other cities have been presented by them in the Senate. Numerous other memorials of similar purport have been filed in both Houses, and in addition resolutions and memorials advocating reciprocal concessions to Cuba and reductions in the Dingley rates on Philippine products have also been received from influential bodies of business men both East and West. Copies of the resolutions adopted by the Merchants' Association of New York advocating a reciprocal arrangement for Cuba have been received by prominent members of both House.

The champions of reciprocity are examining with a good deal of interest the statements which are now being circulated designed to show that although our foreign trade appears to be falling off, such is not actually the case. In these statements much emphasis is put upon the fact that there has been some reduction in the price of various exported products, which it is said accounts for the apparent decrease in our total shipments. It is also pointed out that in our tables of foreign exports no credit is given for our shipments to the Hawaiian Islands and Porto Rico. These suggestions have little force, however, it is claimed by the advocates of reciprocity, for the reason that they account for only a small percentage of the apparent loss. Not only do the figures show that our exports for the 11 months ending November 31 decreased $4,000,000 from the corresponding figures of a year ago, but they disclose the fact that in 1900 we made a gain over 1899 of $180,000,000, and in 1898 a gain over 1897 of $145,000,000. In other words, it is claimed we have not only ceased making the normal increase, which in recent years has approximated 15 per cent. per annum, but we have made a net loss of $4,000,000. No reduction in prices, it is contended, can account for the fact that while in recent years our exports have increased at the rate of $150,000,000 per annum, this year the increase is wiped out and a decrease of $4,000,000 is recorded. The comparatively insignificant exports to Porto Rico and Hawaii, it is contended, help the matter but little more. W. L. C.

## Worcester Industries.

The great business of Norcross Bros., building contractors, of Worcester, has been incorporated under Massachusetts laws as the Norcross Bros. Company, with a paid in capital stock of $1,500,000. The officers are Orlando W. Norcross, president; William J. Denholm, vice-president; Albert J. Park, treasurer; and these three officers constitute the Board of Directors. Thomas O'Reilly will continue as New York manager and Freelon Morris as Boston manager. The corporation begin their existence as such with about $5,500,000 of contracts, including the New York Public Library. The home office is in Worcester, where the machine shops and wood working shops are located. The company have quarries in several States and stone yards in Boston and Cleveland.

The formal announcement by the American Steel & Wire Company of a new system of pensioning employees was received by the 6000 men of the Washburn & Moen Department with much pleasure, because they had been wondering what had become of the fund which had resulted from the setting aside of money equivalent to 2½ per cent. of the mill pay roll for the benefit of employees, as announced January 1, 1900, at the time of the 7½ per cent. increase in wages. Now they are satisfied. The Worcester Mill Committee, in charge of the local end of the pension department, will consist of Manager Charles Ranlet of the department, and the foremen of the various departments of the works.

The Washburn & Moen Department of the American Steel & Wire Company have installed a large annealing furnace at its Central works at South Worcester. While in itself this is not a large addition to the Worcester plant, it means, according to the local management, that the Central works will be permanently open for business. A year and a half ago this plant was abandoned, the windows were boarded up and no one expected to see the property used again by its new owners, who had purchased it from the Worcester Wire Company. But last spring a portion of the mills was started up to relieve the tremendous pressure of business at the North and South works, but it was only as a temporary expedient, it was supposed. However, instead of closing the mills, more men were added to their force from time to time, until now they are running nearly full, and it is generally believed the Central works will be as permanent as the very much larger North and South works, formerly owned by the Washburn & Moen Mfg. Company.

The Morgan Construction Company of Worcester are building a roughing mill for the Illinois Steel Company, to be installed at Milwaukee, Wis. The mill will turn out billets for the company's rolling mills.

The Holyoke Machine Company of Worcester and Holyoke, Mass., are rushed to the limit with orders. The turbine water wheel department of the business was moved to Holyoke some time ago, because of a strike of the company's molders, an exceptional occurrence in Worcester, where the labor unions have made little progress toward getting a commanding position of the labor situation. The Worcester plant of the company, which is a large one, is devoted to millwright's work, and there is such a rush of orders that delivery is necessarily slow. The company have orders for equipping factories with shafting and the like equipment from all over New England and from points beyond in the Middle West and Middle Atlantic States.

The George Burnham Company, manufacturers of upright drills and planer chucks, are planning to build a new shop on Hammond street, near the Boston & Albany Railroad. The company have outgrown their present quarters on Hermon street. The building will be of wood, 125 x 40 feet in dimensions.

Another Hermon street concern, who are soon to build a new factory, are that of P. E. Somers, manufacturer of tacks. Mr. Somers owns 10,000 square feet of land on Lagrange street, on which he will erect a shop in the near future.

The Worcester Consolidated Street Railway Company have placed an order with the Pennsylvania Steel Company for heavy girder rails for some miles of new track. The rails will be of the half groove type, 95 pounds to the yard. The contract calls for delivery in time for laying in the early spring. In all, the contract calls for about 1300 tons.

The Worcester Electric Light Company have placed an order for two generators with the General Electric Company. One will be of 1200 kw., to be of the fly wheel type, directly attached to an 1800 horse-power horizontal engine, the contract for which has been awarded to the International Power Company of Providence, R. I. The other generator will be of 800 kw., to be directly attached to one of the company's present engines, which will be altered to increase its horse-power from 1000 to 1200. The two generators will add 2000 horse-power to the efficiency of the company's plant on Faraday street. The International Power Company have both contracts, amounting to about $30,000.

The Eastern Bridge & Structural Company have built for the Dominion Steamship Company a marine coal handling tower of the Campbell cantilever type for use on a lighter in coaling ships. The structure weighs 50 tons, and consists of a double steel tower 90 feet in hight, to be set up on the deck of the lighter. There are two booms overhanging the deck at a hight of 35 feet, which will permit of landing coal over the hatch of the largest steamers. On each boom travels a trolley conveying a bucket similar to a clam shell dredge, with a capacity of 1½ tons of coal. The engines which operate the trolley are arranged at the foot of the tower. The lighter is placed between a coal barge and the steamship, and the apparatus of the tower quickly transfers the coal from barge to the hold of the big ship. The coal is weighed automatically in the process. It is claimed for the tower that ships may be coaled at sea as easily as at dock, and that it is a much cheaper and quicker method of coaling than anything now in use. A duplicate of the tower is being installed on one of the docks at London, England, and another is in successful operation at Houghton, Mich. One of the Dominion Line steamers has already received, by means of this apparatus, a cargo of 7000 tons of coal for a cruise in the Mediterranean. All ships plying between the United States and South European ports coal for the round trip on this side of the water, because of the scarcity of coaling stations in Mediterranean waters. Until recently all such ships sailed for New York, but now that the Dominion Line have established a line of steamers from Boston, it was necessary that new means of coaling should be found, and the result was the contract awarded the Worcester Company.

The Eastern Bridge & Structural Company have been awarded the contract for the big foundry to be built in Worcester by F. E. Reed, already told about in the Worcester letter to *The Iron Age*.

It is reported, and the report is not denied, that the Iver Johnson Company, manufacturers of bicycles, at Fitchburg, Mass., are looking for a new location, and several Connecticut cities have been visited by representatives of the company to look over sites. The reason given for the desired change is that the company have suffered recently from strikes, particularly one of their polishers, which caused serious inconvenience.

The Plunger Elevator Company of Worcester have been awarded the contract for 12 elevators for the new Saks Building, at Broadway and Thirty-fourth street, New York. Six of them will be for passengers and six for freight. The lift will be 125 feet in each case. The Plunger Company are rushed with orders, and are running day and night, in spite of the fact that a very large addition has recently been occupied. J. N.

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It is reported that the Chesapeake & Ohio railway, which now has a monopoly of transporting New River coal and coke, will endeavor to follow the plan of the Norfolk & Western and secure by purchase the coal fields situated on its line.

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President Callaway of the American Locomotive Company is quoted as saying that it is the intention to spend at least $2,000,000 in improving the plants. The production of the works at Schenectady will be increased to 1000, thus doubling it.

## PERSONAL.

Henry C. Frick of Pittsburgh has been elected a director of the International Bank Corporation of New York City.

David F. Henry, vice-president and general manager of the Central District & Printing Telegraph Company, at Pittsburgh, Pa., will resign his position, effective February 12. Mr. Henry has been connected with telephone interests in Pittsburgh for more than 25 years and was one of the pioneers in that business.

Fred. W. Gardner of Chicago, for 20 years Western manager of the Michigan Stove Company, has retired to devote his attention to his private interests.

The general sales office of the Pennsylvania Steel Company and of the Maryland Steel Company will be located at Philadelphia, in the Girard Building, H. F. Martin being general manager of sales. Chas. W. Reinoehl will be the sales agent at the local office, which will be retained at the plant of the Pennsylvania Steel Company, at Steelton, Pa.

Arthur F. Luke has resigned the position of treasurer of the United States Steel Corporation, to become a member of the banking house of Darr, Luke & Moore of New York and Pittsburgh. He is succeeded by Richard Trimble, secretary of the United States Steel Corporation. Mr. Luke was formerly treasurer of the National Tube Company, now one of the subsidiary concerns of the corporation.

The Midland Works of the American Sheet Steel Company gave a banquet on New Year's Eve at the Country Club, at Muncie, Ind., to the superintendents, foremen, shippers, office force, and their wives, Mr. and Mrs. Ambrose Beard acting as host and hostess. The affair was unusual in the Indiana town and was so thoroughly enjoyed that much favorable comment resulted. No detail was omitted that would tend to the pleasure and comfort of guests, even to sending home the young people on a special electric car and the older people to their doors in cabs. Mr. Beard made a brief address that was well received. He thanked his assistants for their co-operation in producing good results and pointed out the many benefits that were derived from harmonious work. He also suggested that the old worn out saying about corporations having no soul be forgotten. He had found it to be true only in isolated cases, and certainly not in that of the American Sheet Steel Company.

Arnold K. Reese, manager of the Lebanon furnaces, has resigned, and will go to Cardiff, Wales, where he will reside after March 1, as superintendent of the blast furnaces of Guest Keen & Co., whose furnaces are to be rebuilt. Mr. Reese was formerly superintendent of the Maryland Steel Company's furnaces at Sparrow's Point.

The Phipps Botanical Hall, located in Schenley Park, Pittsburgh, donated by Henry Phipps, has been completed. The building cost about $30,000.

The employees of the Spearman Furnace on New Year's Day presented to Mr. Spearman, the retiring head of the Spearman Iron Company, a handsome gold headed cane as a token of their respect. Mr. Spearman is probably the oldest iron manufacturer in Western Pennsylvania. He entered the business in January, 1847, when he accepted the management of the Sharon Furnace, which was operated at the time by Shoenberger, Agnew & Co. In 1853 he purchased the Mazeppa Furnace, near Mercer, which he operated until 1859, when he became manager of the old Sharpsville Furnace, where he remained until 1862. In 1872 he organized the Spearman Furnace and has ever since been at the head of that corporation.

Robert K. Dana, for many years agent and New York manager of the Washburn & Moen Mfg. Company, has associated himself with the banking house of Yates, Ritchie & Pope. Mr. Dana will be the manager of the recently opened uptown branch, at 28 West Thirty-third street.

Charles M. Schwab, president of the United States Steel Corporation, is expected back from Europe in the middle of next month.

W. P. Bache, assistant to the president of the American Sheet Steel Company, sailed last Saturday for a trip to Egypt

George A. Chalfant has retired from the firm of Spang, Chalfant & Co., Incorporated, operating the Etna Iron & Tube Works in Pittsburgh.

Frank Jarvis has resigned his position with the Youngstown Iron, Sheet & Tube Company, and has connected himself with the Youngstown Iron & Steel Roofing Company, operating sheet mills at Youngstown, Ohio. Mr. Jarvis was formerly with the New Process Galvanizing Company, at Niles, Ohio.

Samuel McDonald, superintendent of the Bessemer steel plant of the Republic Iron & Steel Company, at Youngstown, Ohio, has resigned, to take effect February 1. Mr. McDonald has been with the Republic Company for the past two years as superintendent of their Bessemer works.

Roger D. Bowman, one of the assistant superintendents at the Duquesne steel works of the Carnegie Steel Company, has resigned, and will probably accept a position with the Dominion Iron & Steel Company.

John H. Jones has been elected president of the Manufacturers' & Consumers' Coal Company, recently organized at Pittsburgh, with a capital of $5,000,000. He is one of the organizers of the Pittsburgh & Buffalo Company and treasurer and general manager of that corporation.

Emil Swenssen, member of the Society of Civil Engineers, and formerly superintendent of the Keystone works of the American Bridge Company in Pittsburgh, has opened an office in room 600, Lewis Block, that city, as civil and consulting engineer.

Henry C. Frick of Pittsburgh denies that he has offered $100,000 to Wooster University, at Wooster, Ohio.

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**The Ashland Iron & Mining Company.**—The Ashland Coal & Iron Railway Company were organized under special acts of Legislature of Kentucky, and were empowered by their charter to carry on mining and manufacturing, as well as to operate a railway. Their railway business has been to conduct transportation as a common carrier over 22 miles of railroad. Their other business has been the mining, transportation and sale of coal, and the manufacture and sale of pig iron. Under the change of legislative policy in Kentucky railway companies are prohibited from engaging or continuing in any business not germane to that of a common carrier. To conform to existing laws it became necessary that the Ashland Coal & Iron Railway Company should dispose of their property other than their railway and their properties connected with their business as a public carrier. The Ashland Iron & Mining Company have purchased, taken over and will conduct the business of mining coal and manufacturing iron formerly owned and conducted by the Ashland Coal & Iron Railway Company. By these purchases, conveyances and assignments to them the Ashland Iron & Mining Company are a fully organized, equipped and going concern, with necessary plants, machinery and appliances for continuing the business of mining and manufacturing formerly carried on by the Ashland Coal & Iron Railway Company.

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**A Rod Record.**—The world's record for steel rod production was broken on Monday, January 6, at the Rankin plant of the American Steel & Wire Company. For the 24 hours ending at 5 p. m. the rod mill had made 586,070 pounds of finished rods, which beats the world's record made by the same mill on January 2, 1901, when 572,310 pounds of rods was turned out. The management of the plant are jubilant over the record and every whistle at the mill blew for 15 minutes in honor of the record. The Rankin plant will attempt this month to beat the world's record for tonnage in finished rod for one month.

# MANUFACTURING.

### Iron and Steel.

David Lamond & Sons, engineers and contractors, Ferguson Building, Pittsburgh, have received a contract for three C. H. Foote fire brick stoves, two-pass type, 19 x 85 feet over all, to be erected at Tuscaloosa, Ala., for the Central Iron & Coal Company. David Lamond & Sons have a number of other contracts for this type of stove, to be erected at other blast furnace plants.

Wilkoff Brothers, operating a plant at Youngstown, Ohio, for the production of scrap for mill work, deny that the plant is to be removed from Youngstown to some other location.

The Bradford Steel Company have recently completed the erection of a plant at Bradford, Pa., to manufacture tempered steel from cast iron, under patents owned and controlled by the Duplex Metal Company of Bradford, Pa. By this process it is claimed that steel can be made at less than half the present cost. One furnace at the new plant has been finished, and if the steel made is satisfactory more furnaces will be built at once.

The Lukens Iron & Steel Company of Coatesville, Pa., have purchased the Reynolds iron works in New Orleans, La., in order to add to their facilities for marketing heavy material. In addition to steel plates, boiler braces and flanged heads, which they make themselves, they are carrying in that warehouse structural steel of various kinds, together with bars, tool steel, boiler tubes, thin sheets, galvanized iron, rivets and a variety of supplies. J. W. Porch is manager of that branch.

The Shenango Furnace Company now own and will operate three stacks at Sharpsville, Pa. Two of these are at a plant formerly known as Douglas Furnaces, and one (No. 3) at what was until this date Spearman Iron Company. It is the intention of the owners, W. P. Snyder & Co., to run these furnaces on Bessemer and basic iron entirely. W. A. Barrows, Jr., formerly superintendent at Shenango furnaces, is appointed general manager. Geo. L. Collord, formerly assistant superintendent, Shenango, is superintendent of Nos. 1 and 2. The Spearman organization will be continued at Shenango No. 3.

The Lobdell Car Wheel Company, Wilmington, Del., blew out their White Rock Furnace on Dec. 23.

The muck bar mill of the Stewart Iron Company, Limited, at Sharon, Pa., which has been idle for some time, has started up again.

The Ivanhoe Furnace, Virginia, was fired on December 30.

It is reported that G. C. Jameson, of Wheeling, W. Va., with some other parties, will build a tin plate mill at New Martinsville, W. Va.

The annual meeting of the stockholders of the Sharon Steel Company will be held in Sharon, Pa., on Tuesday, January 28. It is expected that at this meeting Frank H. Buhl, former president of the company, will resign from the Board of Directors.

The Alabama & Georgia Iron Company, Cedartown, Ga., expect to blow in their Cherokee Furnace the current week.

The Claire Iron Company expect to blow in their Bloom Furnace, Bloom Switch, Ohio, during the current week.

If the weather continues mild, it is probable a part of the large new plant of the Youngstown Iron Sheet & Tube Company, at Youngstown, Ohio, will be started this week.

Dover Furnace, of the Penn Iron & Coal Company, at Canal Dover, Ohio, is to be remodeled and rebuilt on a larger scale. The concern expect to spend about $100,000 improving this furnace.

The Empire Steel & Iron Company expect to blow in Shenandoah Furnace, Shenandoah, Va., April 1. A force of men are now at work getting her ready for operation.

### General Machinery.

The report that the American Locomotive Company would build a large addition to their Pittsburgh works in Allegheny, Pa., is not correct. No additions to this plant are contemplated at this time.

The Standard Connecting Rod Company of Beaver Falls, Pa., have been incorporated with a capital of $30,000. Prominent stockholders in the new concern are A. Rasner and H. F. Dinger of Pittsburgh.

The large foundry and machine shops of the William B. Pollock Company, at Youngstown, Ohio, are about completed and will probably start up this week.

The Anchor Engineering & Machine Company of Pittsburgh have been organized and will manufacture the Anchor gas engine and general rolling mill machinery.

The United States Tool Holder Company, recently incorporated with a capital stock of $15,000, have located their works at Springfield, Ohio. The product of the company will be improved tool holders, planer and shaper tools.

The city of Jamestown, N. Y., has offered $500,000 for the water company's plant. If it is not accepted the city will construct an entirely new plant at a cost of $600,000, plans for which have been prepared by J. F. Wilmer of Buffalo. Communications should be addressed to S. A. Carlson, secretary Board of Public Works, Jamestown.

The Michigan Steel Boat Company, Kalamazoo, Mich., are arranging to remove their business to Detroit and are planning for the erection of a main building, 80 x 250 feet, which will be located on Jefferson avenue, near the car house of the United Railway Company. Another building will be erected to be used as a boiler and engine house. The company will equip their factory with new and improved machinery.

The Thew Automatic Shovel Company, Lorain, Ohio, are increasing the capacity of their plant from 60 to 75 per cent., by the erection of an addition to the machine shop, 80 x 100 feet, and an extension of 80 feet to the blacksmith shop. Equipment has been purchased.

The Weaver Power Company, Asheville, N. C., have let the contract for the erection of a 3000 horse-power plant to furnish electrical power to run a cotton mill, railway and lighting system, which are to be built in the near future. Work will begin at once.

The village of Champlain, N. Y., is in the market for a second-hand road making machine, stone crusher, engine and steam road roller. Communications should be addressed to W. G. Graves, president.

The MacPherson Switch & Frog Company, Niagara Falls, N. Y., will locate a branch plant at Niagara Falls, Ont. The contract for the buildings has been let.

The Marion Machine & Tool Company, Marion, Ind., who have recently signed a contract with the Upper Sandusky, Ohio, Board of Trade for the removal of their plant to that city, have prepared specifications for their plant, which is to be erected at once. There will be six buildings, as follows: Machine shop, 80 x 150 feet; foundry, 60 x 110 feet; wareroom, 80 x 40 feet; boiler and engine house, 60 x 30 feet; coal and storage and office buildings, 30 x 30 feet each. The plant will employ 100 men after the first year.

The American District Steam Company of Lockport, N. Y., have applied for a franchise in Cleveland to build a steam heating and power system in Cleveland. The company agree to build a $700,000 plant if the franchise is granted.

The Ohio Steam Pump Company of Canton, Ohio, expect soon to increase the capacity of their plant one-third by the addition of a number of new machine tools.

The New York Blower Company of Bucyrus, Ohio, have just completed one of the largest heating apparatus outfits ever built, for the new plant of the Brown Hoisting Machinery Company of Cleveland. The blower company have contracts on hand which will keep them very busy for three months.

The Jewett Motor Carriage Company, Jewett, Ohio, recently organized, are now ready to purchase machinery to equip their plant. They have secured the buildings, 100 x 200 feet, formerly occupied by the Jewett Street Car Company, which they will equip for the manufacture of automobiles. Address communications to S. F. Sweitzer, Beach City, Ohio.

The Steel Car Forge Company, with works in Ellwood City, Pa., and offices in Pittsburgh, have operated their plant for more than a year to full capacity, and on account of having so many orders, and also because of the bright outlook for business, will make some extensive additions to their plant, including a 30-foot extension to the machine shop. The company recently added to their equipment a Bliss hot trimming press, a No. 6 Hilles & Jones punch shear, a No. 1 Williams & White punch and shear, a 5-foot radial drill, made by the American Tool Works Company; a 1500-pound Chambersburg drop hammer, and also a power chain hammer of their own design. The officers of the Steel Car Forge Company are Henry R. Rea, president, and A. R. Fraser, secretary and treasurer.

The business of the Vulcan Mfg. Company and the Fullman Company, both in Pittsburgh, has been consolidated, and new and larger quarters have been secured in the Imperial Power Building in that city. The business of the concern is electrical contractors and general machinists. The new firm are filling two large electrical contracts, these being the electrical work for the new union depot in Pittsburgh, and also for the new residence being built by L. C. Phipps, in the East End, Pittsburgh.

### Boilers, Engines and Accessories.

The Detroit Separator Company, 59 Home Bank Building, Detroit, Mich., have organized for the manufacture of live steam and exhaust separators. James C. McGregor is general manager.

The Fairhaven & Westville Railroad Company, New Haven, Conn., will erect a brick addition, 80 x 100 feet, to the power house. All equipment has been purchased.

The Oklahoma Consolidated Railway Company, El Reno, Okla., recently incorporated with $2,000,000 capital stock, will be in the market in about 60 days for entire equipment for the new electric road and telephone lines they are to build from El Reno to Kingfisher, Oklahoma City and Guthrie; estimated distance 100 miles. Communications should be addressed to George W. Willis, El Reno.

S. M. Veail, secretary and treasurer, Kanawha, Glen Jean & Eastern Railroad Company, Chillicothe, Ohio, advises us that the company will be in the market in the early spring for complete power plant equipment. As soon as the engineers' report on the final location can be obtained, which will probably be in

March or April, the contracts for the construction of the road will be let. It will be about 15 miles long, operated by electricity, and will run through Thurmond, Glen Jean, Derryhale, Macdonald, Kilsyth and Oswald. T. G. McKell of Chillicothe is president, and Thomas Nicholl of Glen Jean, W. Va., chief engineer.

The Pennsylvania lines west of Pittsburgh will place orders before long for 50 new fast passenger engines. Most of these will have 72-inch driving wheels.

A new power plant is to be installed by the Michigan Steel Boat Company, Kalamazoo, Mich. See "General Machinery."

The Suffolk Light, Heat & Power Company, Southampton, N. Y., have let contracts for the installation of a plant to be completed and ready to furnish light by May 1.

The Harrisburg Foundry & Machine Works, Harrisburg, Pa., manufacturers of engines, boilers, road rollers, &c., will enlarge their plant by the erection of an addition, 50 x 160 feet, three stories, of brick and cement, with slate roof. The equipment will be modern throughout and will be operated by electricity. The lighting and power will be furnished by the main electric power plant. Very little new equipment will be required.

The Standard Motor Company, Kokomo, Ind., recently incorporated with a capital of $20,000, are the outgrowth of the Standard Mfg. Company, manufacturers of gas and gasoline engines, and for the present will occupy the buildings formerly used by the latter. They intend to erect a larger plant later and will build automobiles.

The Fire Department of Springfield, Ohio, has called for bids on three steam fire engines.

The Marine Boiler Works Company of Toledo, Ohio, will be organized shortly with $100,000 capital stock, to carry on the business heretofore conducted by the Richard Reeves Company, that city. Mr. Reeves will continue in charge. The company have purchased a 4-acre site adjoining the plant of the Craig Shipbuilding Company, and plans have been prepared for a building, 235 x 100 feet. The factory will be covered by hydraulic and electric cranes, and will be equipped with machinery for the production of marine and high pressure stationary boilers.

The Water Works Department of Zanesville, Ohio, has placed a contract with the Laidlaw-Dunn-Gordon branch of the International Steam Pump Company for a duplex compound condensing pumping engine having a capacity of 4,000,000 gallons per day. Other improvements will be made to the city pumping station.

The Vilter Mfg. Company, builders of refrigerating and ice making machinery, Corliss engines, &c., Milwaukee, Wis., have recently closed contracts with the following parties: Ruemmeli Mfg. Company, St. Louis, Mo., three 150-ton, one 130-ton, five 100-ton, three 50-ton, two 75-ton, one 10-ton refrigerating machines; Arnold Brewing Company, Sault Ste. Marie, Mich., one 35-ton refrigerating machine; J. K. Farley Mfg. Company, Chicago, Ill., one 25-ton refrigerating machine; Iowa Iron Works Company, Dubuque, Iowa, one 2-ton refrigerating machine; Globe Ice & Cold Storage Company, Globe, Ariz., one 10-ton ice plant; Chartiers Valley Brewing Company, Carnegie, Pa., one 100-ton machine with 15-ton ice plant, and one 50-ton refrigerating machine; Milwaukee County Hospital, Wauwatosa, Wis., one 2-ton refrigerating machine; Capital Brewing & Malting Company, Helena, Mont., one 20-ton refrigerating machine; Tucson Ice & Cold Storage Company, Tucson, Ariz., one 10-ton ice plant; New Castle Brewing Company, New Castle, Pa., one refrigerating and ice plant; Kansas Ice & Storage Company, Salina, Kan., one 40-ton ice plant and 40 tons refrigerating capacity; Capital Brewing Company, Whatcom, Wash., two 35-ton refrigerating machines; Goenner & Co., Johnstown, Pa., one 100-ton refrigerating machine; Leonard C. Smith, contracting engineer, New York, one 100-ton refrigerating machine for Jas. Everard's warehouse, one 200-ton and 100-ton machines for Jas. Everard's Brewery ice plant, and 100-ton refrigerating machine for Flanagan, Nay & Co.'s brewery; Theo. Hamm Brewing Company, St. Paul, Minn., one 320-ton refrigerating machine; Pittsburgh Brewing Company, Phœnix Branch, one 135-ton ammonia condenser; Weisbrod & Hess, Philadelphia, Pa., direct expansion piping; H. Annegers & Bro., Dayton, Ohio, direct expansion piping; Gutsch Brewing Company, Sheboygan, Wis., direct expansion piping; Burkhardt's Brewery, Akron, Ohio, direct expansion piping; Goetz and Brada Mfg. Company, Chicago, Ill., 12 x 30 Corliss engine; Sawyer & Austin Lumber Company, Pine Bluff, Ark., 24 x 42 Corliss engine; Duluth Brewing & Malting Company, Duluth, Minn., 16 x 36 Corliss engine; Allentown Shoe Mfg. Company, Allentown, Pa., 12 x 30 Corliss Engine; Ambrose West, Plymouth, Pa., 14 x 36 Corliss engine; Deerbrook Milling & Mercantile Company, Deerbrook, Wis., 12 x 30 Corliss engine; South Bend Chilled Plow Company, South Bend, Ind., 24 x 42 Corliss engine; Wendnagel & Co., Chicago, Ill., 16 x 36 Corliss engine; Schiess y Cia., Torreon, Mex., 14 x 36 Corliss engine; Hess & Hopkins Leather Company, Rockford, Ill., 18 x 42 Corliss engine; Binsfeld Bros., Chilton, Wis., 14 x 30 Corliss engine; O. F. Mayer & Bro., Chicago, Ill., 12 x 30 Corliss engine; Foster-Hafner Mills, Oshkosh, Wis., 24 x 48 Corliss engine; Block Bros. Tobacco Company, Wheeling, W. Va., 18 x 36 Corliss engine; T. G. Mande Vehicle Company, Stoughton, Wis., 18 x 36 Corliss engine; American Hulled Bean Company, Battle Creek, Mich., 14 x 36 Corliss engine; Moore-Cortes Canal Company, Crowley, La., 22 x 44 x 48 tandem compound Corliss engine, and Roller Canal Company, Crowley, La., 26 x 48 compound Corliss engine. This list is convincing evidence of the active condition of business throughout the country, as the orders came from all sections, and from a great variety of trades.

The Geo. D. Pohl Mfg. Company, Vernon, N. Y., manufacturers of Advance gas and gasoline engines, contemplate enlarging their works.

James Rees & Sons, operating the Duquesne Engine & Boiler Works in Pittsburgh, have bought a site on Duquesne Way, in that city, on which they will erect a new plant. The old works of this concern will be abandoned to make way for the new warehouses, to be built in the Point district in Pittsburgh.

### Foundries.

Plant B of the United States Cast Iron Pipe & Foundry Company, Scottdale, Pa., is closed to allow some important repairs to be made. These will include a new cupola house, made entirely of structural steel, with iron siding, and will be larger than the old one, allowing room for two elevators instead of one. The cranes, dynamos, electrical appliances, drying ovens and all parts of the equipment will be carefully gone over and given such repairs as are necessary to put this works in first-class condition. The chief engineer of the United States Cast Iron Pipe & Foundry Company is now visiting their Eastern and Southern branches with the view of comparing methods generally. He will give special attention to methods used for drying molds and facing and drilling flange pipe.

The American Foundry Company, Indianapolis, Ind., recently incorporated with a capital of $16,000, are erecting a new plant with a capacity of 15 tons of gray iron castings per day. W. H. Orcutt is treasurer.

### Bridges and Buildings.

The New York, New Haven & Hartford Railroad Company have awarded the contract for the new Scherzer rolling lift bridge, to be erected across Pequonnock River at Bridgeport, Conn., to the Pennsylvania Steel Company of Steelton, Pa. The bridge is to be built under the general bridge specifications recently issued by the railroad company, which call for a load of 5000 pounds per lineal foot in addition to a concentrated load of 100,000 pounds at any point on the floor of the structure.

The Toledo Railway & Terminal Company, Toledo, Ohio, will open bids on January 15 for the construction of a steel bridge over the Miami & Erie Canal, to cost about $7500. S. D. Williams, Jr., is chief engineer.

The Omaha Bridge & Terminal Railway, Omaha, Neb., will construct a two-span steel bridge across the Missouri River between that city and Council Bluffs, Ia. J. A. L. Waddell, 600-611 New Nelson Building, Kansas City, Mo., will supervise the work and all information may be obtained from him.

D. A. Coulter and others of Frankfort, Ind., have organized a company for the purpose of manufacturing bridges. The capital will be $200,000.

The Rochester Bridge & Construction Company, 17 Liberty Building, Rochester, N. Y., manufacturers of bridge, viaduct and structural work, will acquire a plant in New York State at an early date. At present their work is being manufactured at Pittsburgh.

The Northern Ohio Traction Company of Cleveland are having plans prepared for a 400-foot double track bridge to be erected over the gorge near Akron. It will cost about $60,000.

The Canton Bridge Company of Canton, Ohio, are planning to make extensive improvements to their plant during the next two months.

The McClintic-Marshall Construction Company, Park Building, Pittsburgh, have received a contract for the erection of the steel buildings for the new works of Dilworth, Porter & Co., to be built in that city to replace the plant recently destroyed by fire. Three buildings will be erected. The two main buildings will be 110 x 485 feet, and 90 x 360 feet, and the third is to be a warehouse, 110 x 95 feet.

The James G. Cochran Company of Pittsburgh have applied for a charter and will carry on a general construction and contracting business in bridges, buildings and steel structural work of all kinds.

### Fires.

The corrugated iron and tin plant of Bergen Brothers, Philadelphia, Pa., suffered a $3000 loss by fire January 4.

Fire recently did $10,000 damage to the stove foundry of Rathbone, Sard & Co., Albany, N. Y.

The factory of the Moosehead Silk Company, Harrison, N. Y., was destroyed by fire January 2. The loss will reach $50,000.

Sargent & Co.'s steel foundry at Chicago Heights, Ill., recently suffered an $8000 loss by fire.

The foundry of the F. F. Collins Mfg. Company, San Antonio, Texas, was recently partly destroyed by fire. The loss is $5000, fully covered by insurance.

The plant of the Woolley Foundry & Machine Company, In-

dianapolis, Ind., was partially destroyed by fire recently. The loss will reach about $10,000.

The large tobacco factory of Cameron & Cameron, Richmond, Va., was destroyed by fire January 7. The loss is estimated at $150,000, fully covered by insurance.

**Hardware.**

Ira B. Smith, Bristol, Conn., finding his facilities inadequate to supply his rapidly increasing trade, has erected a modern factory building. Mr. Smith is now equipped to do all kinds of sheet metal stamping and pressing, also dies and tools of every description, patterns, electro-plating, &c.

The interests of the Lisk Mfg. Company and the McLaughlin-Martin-Parkhurst Company, both of Canandaigua, N. Y., are to be consolidated under the former style. The Lisk Company were organized 12 years ago and manufacture antirust tinware. The McLaughlin-Martin-Parkhurst Company were formed during the past year for the purpose of manufacturing enameled ware. The leading stockholders in each company are interested in the other, so that the matter of consolidation will not be a difficult one.

The H. M. Justice Company, Baltimore, Md., have been incorporated by Herbert M. Justice, Joseph M. Smith, John H. Kreh, Geo. W. Lockner, and Charles C. Stieff, with a capital stock of $5000. The company will manufacture cutlery and silver plated ware.

Frederick S. Amidon, for 25 years manufacturer of wire screens in Hartford, Conn., has retired from the business, which will hereafter be conducted under the style of the Amidon Wire Works Company.

P. E. Somers, manufacturer of tacks, Worcester, Mass., during the coming spring will erect a new factory. The business has outgrown his present quarters, and the new shop will be built on lines to accommodate the enlarging demand. The shop will be about 135 x 38 feet, two stories high.

The New York Wire Cloth Company are intending to erect additional buildings to their works at York, Pa. The new buildings will be for the purpose of manufacturing paints and varnishes for their own use.

Light Cycle Company, Pottstown, Pa., have reorganized, and elected the following officers and directors: J. S. Wagner, president; Frank S. Brant, vice-president; E. R. Fretz, secretary, treasurer and general manager; W. I. Grubb, superintendent, and H. B. Christman. The company will not increase their capital, but have asked the stockholders to allow them to make a loan of $10,000, which will be used in promoting the manufacture of bicycles, automobile accessories, such as running gears, quick inspection ball bearing wheels, &c., and compensating gear of the spur type; to order, such parts as variable speed gears, reverse gears, motors, &c. The company state that they are already in touch with and doing work for some of the largest concerns in the country.

Wrightsville Hardware Company, Wrightsville, Pa., advise us that while their trade with Russia has fallen off through the tariff complications with that country, their business with other nations has been gradually increasing, and their home trade has more than doubled during the last 12 months, thus more than taking up their increased output. They have recently come into possession of the old Henry James property of about 9 acres adjoining their present site. This property was for 75 years one of the greatest lumbering plants south of Williamsport on the Susquehanna River. It is the purpose of the company to establish an electric light and power plant with the water power and either incorporate the balance of the land with their present plant or turn it over to other industrial operations, as it is equipped with ample railroad facilities.

**Miscellaneous.**

F. M. Hicks of the Hicks Locomotive Company, Chicago, Ill., has during the past week received the following orders: Two ten-wheel engines for Vera Cruz Pacific Railway; three four-wheel switch engines for Lake Superior & Ishpeming Railroad, and seven coaches for Quebec Southern Railway.

In order to separate the manufacturing from the commercial business of Schaw, Ingram, Batcher & Co.'s various interests in Sacramento, Cal., the Schaw-Batcher Company Pipe Works have been incorporated for the purpose of manufacturing riveted sheet metal and iron pipe for irrigation, mining and power plants, &c. The company have filled contracts for some of the largest plants in California, and the operations also extend over Oregon, Washington, Idaho, Montana and Alaska.

The Economy Locomotive Sander Company, 805 Fidelity Building, Baltimore, Md., have reorganized under the same name with a full paid capital stock of $300,000. The officers of the company are: President, Jos. M. Coale of the Coale Muffler & Safety Valve Company of Baltimore; vice-president, John Hanway of New York City; treasurer, Frank W. Coale, and secretary, John S. Bridges. They make the Economy pneumatic track sanders.

The Variety Machine Company, Warsaw, N. Y., announce that the name of the corporation has been changed to the Warsaw Elevator Company. This change is in name only and does not affect the management or *personnel*.

The J. G. Brill Company, Philadelphia, Pa., inform us that the report that they had acquired the works of the Billmeyer & Small Company, York, Pa., and would resume the manufacture of cars at that place is untrue.

Earl B. Hawks and Charles T. Anderson, Dowagiac, Mich., will erect a gas plant at that place.

The Holly Wagon Company, Holly, Mich., recently organized, will erect a new plant, 110 x 240 feet, for the manufacture of steam and farm wagons. J. W. Patterson is secretary.

As soon as a site is selected, A. L. Wetherald, 314 Main street, Greenfield, Ind., will erect a modern chain plant.

There is a movement on foot at Madison, Wis., to organize a company and erect a plant for the manufacture on a large scale of a new self feeder for corn huskers and shredders, invented by Power & Curtis of that city.

The Board of Trade of Alliance, Ohio, have organized a land company for the purpose of selling lots and raising a bonus fund for the purpose of securing the location of plants. The Board are considering proposals for the location of the Lake Erie, Alliance & Wheeling Railway shops, the Alliance Machine Company, and the Alliance Finished Steel Company, the two latter recently organized.

The Semet-Solvay Company of Syracuse are looking for a location in or near Cleveland for the erection of a battery of their by-product coke ovens. It is stated the ovens will be erected during the coming year and that they will consume in the neighborhood of 500 tons of coal per day.

The Uehling-Steinbart Company of Carlstadt, manufacturers of enginering and metallurgical instruments, and the New Jersey Sheet Metal Mfg. Company of Elizabeth, N. J., have decided to consolidate under the name of the Uehling-Steinbart Mfg. Company, with offices at Carlstadt, N. J. The directors will be Edward A. Uehling, Alfred Steinbart, Edwin L. Decker, Lewis A. Thompson and John Dickens.

## Shipbuilding in the United States.

During the six months ended December 31, 1901, there were built in the United States and officially numbered by the Bureau of Navigation 717 rigged vessels of 154,073 gross tons, as against 568 vessels of 179,229 gross tons in the latter half of 1900. The principal decline, 19,752 tons, is on the Atlantic seaboard, and is attributable to work on several large ocean steamers, which will be completed during the coming six months. Included in the six months' figures are 38 vessels, each over 1000 tons, and aggregating 103,832 tons. Of these 14 steel steamers, aggregating 52,310 tons, were built on the great lakes. Four are for the seaboard. On the seaboard 15 wooden schooners of 24,864 tons were built. five steel steamers of the coasting trade and one steel ferryboat, aggregating 20,964 tons.

Following are figures for the six months ending December 31, 1901:

| | Wood. | | Steel. | | |
|---|---|---|---|---|---|
| | Sail. Gross. | Steam. Gross. | Sail. Gross. | Steam. Gross. | Totals. Gross. |
| Atlantic and Gulf | 39,723 | 10,204 | 3,609 | 30,811 | 84,347 |
| Porto Rico | 34 | .... | .... | .... | 34 |
| Pacific | 14,430 | 3,781 | .... | .... | 18,211 |
| Great Lakes | 149 | 1,956 | .... | 43,750 | 45,855 |
| Western rivers | 114 | 5,469 | .... | 43 | 5,626 |
| Totals | 54,450 | 21,410 | 3,609 | 74,604 | 154,073 |

Following are the figures for the corresponding six months ended December 31, 1900:

| | Wood. | | Steel. | | |
|---|---|---|---|---|---|
| | Sail. Gross. | Steam. Gross. | Sail. Gross. | Steam. Gross. | Totals. Gross. |
| Atlantic and Gulf | 44,176 | 5,852 | 8,892 | 44,179 | 103,099 |
| Pacific | 13,979 | 5,524 | .... | 1,877 | 21,380 |
| Great Lakes | 108 | 582 | 2,790 | 44,626 | 48,106 |
| Western rivers | 715 | 5,367 | .... | 562 | 6,644 |
| Totals | 58,978 | 17,325 | 11,682 | 91,244 | 179,229 |

About 20 representatives of the various labor organizations in Pittsburgh met in that city Monday night, January 6, to further consider the offer of Andrew Carnegie to donate a sum of money for the establishment of a hospital or hospitals in the Pittsburgh district for the benefit of injured workingmen. A permanent organization was effected and Patrick Dolan, president of the United Mine Workers in the Pittsburgh district, was made chairman, and A. M. Schwartz of the United Brotherhood of Carpenters and Joiners was made secretary. Another meeting will be held on January 14.

# The Iron and Metal Trades.

Hardly have the first signs appeared that there may be an improvement in the supply of Coke when the news comes of possible labor trouble in the Walston Coal district which would seriously embarrass a number of blast furnaces, the majority of which run on Foundry Iron. So far as the Connellsville and West Virginia districts are concerned there seems to be a probability that shipments will soon become better.

As yet the prices of Ore have not been settled. It seems, however, that an advance ranging from 8 to 10 per cent. on certain Mesaba Ores is urgently advocated and may be accepted.

The buying of Foundry Pig continues on a good scale and is widely distributed, consumers of all classes taking additional quantities. The price of Southern Iron, which has been held at $12 for No. 2, Birmingham, by the majority of sellers, is now established for all of them.

In the Chicago district the makers of Malleable Iron Castings and other founders have been turning to Charcoal Iron for relief from the scarcity of Coke Iron, and as a result of the sales made the price of Charcoal Iron has advanced.

The scarcity of Bessemer and Basic Iron in the Central West continues. Further purchases of Basic have been made outside of that territory, for delivery there, one fair sized lot having been sold by a Virginia furnace.

Some little business has been done in imported Bessemer Pig. An interesting transaction is the sale of 24,000 tons of Spiegeleisen at about $24, duty paid.

Little is doing in the Steel market. We hear of occasional small lots of Billets, but the movement does not possess much significance.

Domestic Wire Rods are firmer, owing to scarcity. In the Wire trade there is a growing probability that the outside makers of Wire Nails will get together and put an end to the cutting of prices which has been going on for some time.

In other branches of the industry the new mills are becoming more aggressive. Indications of this are appearing in the Sheet and Pipe trades.

The outlook for Structural Iron continues excellent. Large requirements are constantly making their appearance in all parts of the country.

The makers of Bars, notably in the West, are crowded with inquiries, and are selling freely. There has been, moreover, less trouble about securing prompt delivery.

Reports are current that the Mexican Rail orders have been taken by German makers. It is likely, however, that at least a part of them will be secured by American and English producers.

The Metal trade is generally in an unsettled state. The "official" Copper prices are being cut by outside producers, and the trade seems still convinced that the last of the cuts has not yet come. Tin has had a further drop, and Spelter is not particularly firm.

## A Comparison of Prices.

At date, one week, one month and one year previous.

**Advances Over the Previous Month in Heavy Type. Declines in Italics.**

| | Jan. 9, 1902. | Jan. 2, 1902. | Dec. 11, 1902. | Jan 9, 1901. |
|---|---|---|---|---|
| **PIG IRON:** | | | | |
| Foundry Pig, No. 2, Standard, Philadelphia | **$16.50** | $16.00 | $15.50 | $15.50 |
| Foundry Pig, No. 2, Southern, Cincinnati | 14.25 | 14.25 | 14 25 | 13.75 |
| Foundry Pig, No. 2, Local, Chicago | 15.50 | 15.50 | 15.50 | 15.00 |
| Bessemer Pig, Pittsburgh | **16.75** | 16.75 | 16 25 | 13.00 |
| Gray Forge, Pittsburgh | **16.00** | 15.50 | 15.00 | 13.15 |
| Lake Superior Charcoal, Chicago | **19.25** | 18.50 | 18.60 | 19.50 |
| **BILLETS, RAILS, ETC.:** | | | | |
| Steel Billets, Pittsburgh (nom) | 27.00 | 27.00 | 28 00 | 19.75 |
| Steel Billets, Philadelphia (nom) | ..... | 29.00 | 29.00 | 21.00 |
| Steel Billets, Chicago, (nom) | ..... | ... . | . | 20 75 |
| Wire Rods, Pittsburgh | 32.50 | 34.20* | 34.50* | 35.00 |
| Steel Rails, Heavy, Eastern Mill | 28.00 | 28.00 | 28.00 | 26.00 |
| Spikes, Tidewater | 2.00 | 2.00 | 2.00 | 1 50 |
| Splice Bars, Tidewater | 1.65 | 1.65 | 1.65 | 1.35 |
| **OLD MATERIAL, PER GROSS TON:** | | | | |
| O. Steel Rails, Chicago | **14.75** | 14.00 | 14.00 | 10.00 |
| O. Steel Rails, Philadelphia | **18.25** | 18.00 | 17 75 | 15.00 |
| O. Iron Rails, Chicago | 21.00 | 21 00 | 21.00 | 15 00 |
| O. Iron Rails, Philadelphia | 21.50 | 21.50 | 21.50 | 18.00 |
| O. Car Wheels, Chicago | **16.00** | 16.00 | 15.50 | 11.50 |
| O. Car Wheels, Philadelphia (nom) | **17.00** | 16.75 | 16.75 | 17.00 |
| Heavy Steel Scrap, Chicago | 13.50 | 13.50 | 13.50 | 11.00 |
| **FINISHED IRON AND STEEL, PER POUND:** | | | | |
| Refined Iron Bars, Philadelphia | 1.65 | 1.65 | 1 65 | 1.45 |
| Common Iron Bars, Chicago | 1.65 | 1.65 | 1 65 | 1 45 |
| Common Iron Bars, Youngstown | 1.50 | 1.50 | 1 55 | 1.30 |
| Steel Bars, Tidewater | 1.70 | 1.70 | 1 70 | 1.40 |
| Steel Bars, Pittsburgh | 1.50 | 1.50 | 1 50 | 1 25 |
| Tank Plates, Tidewater | 1.78 | 1.78 | 1 75 | 1 55 |
| Tank Plates, Pittsburgh | 1.60 | 1.60 | 1 60 | 1 40 |
| Beams, Tidewater | 1.75 | 1.75 | 1.75 | 1 65 |
| Beams, Pittsburgh | 1.60 | 1.60 | 1.60 | 1 50 |
| Angles, Tidewater | 1.75 | 1.75 | 1.75 | 1.55 |
| Angles, Pittsburgh | 1.60 | 1 60 | 1 60 | 1 40 |
| Skelp, Grooved Iron, Pittsburgh | *1.70* | 1.75 | 1.72½ | 1.50 |
| Skelp, Sheared Iron, Pittsburgh | *1.75* | 1.80 | 1.80 | 1.55 |
| Sheets, No. 27, Pittsburgh | 2.90 | 2.90 | 2.90 | 2.85 |
| Barb Wire, f.o.b. Pittsburgh | 2.90 | 2 90 | 2.90 | 2 80 |
| Wire Nails, f.o.b. Pittsburgh | 2.00 | 1.95 | 2.00 | 2.20 |
| Cut Nails, Pittsburgh | 2.05 | 2.05 | 2.05 | 1.95 |
| **METALS:** | | | | |
| Copper, New York (nom) | *11.75* | 11.75 | 16.10 | 17.00 |
| Spelter, St. Louis | *4.12½* | 4 12½ | 4.17½ | 3.95 |
| Lead, New York | *4.00* | 4.00 | 4.37½ | 4.37½ |
| Lead, St. Louis | *3.90* | 3.95 | 4.25 | 4.17½ |
| Tin, New York | *28.50* | 28 50 | 25.25 | 26.50 |
| Antimony, Hallett, New York | *8.25* | 8 25 | 8 87½ | 9.25 |
| Nickel, New York | 60.00 | 60.00 | 60 00 | 55 00 |
| Tin Plate, Domestic Bessemer, 100 lbs., New York | 4.19 | 4.19 | 4.19 | 4.19 |

* Delivered.

## Chicago.

FISHER BUILDING, January 8, 1902.—(*By Telegraph.*)

The scarcity of Coke is still causing much embarrassment to local Pig Iron manufacturers and foundrymen. It had been expected that relief would be experienced before this time, but although promises are being made with some assurance by railroad companies the immediate condition of affairs is as bad as ever. The number of furnaces prevented from operating on this account is unchanged from last week, two stacks having been started up, but two others being banked. Such strenuous efforts are being made to secure Coke from localities outside of Connellsville and West Virginia that it certainly seems that consumers will soon be able to get enough to supply their wants. The strength of the market for Pig Iron, as well as most finished products, is well maintained. It is a remarkable fact that most of the business now doing is at prices considerably above our inside quotations. So many consumers are in urgent need of material that they are purchasing from other parties than those with whom they have contracts and are paying advanced rates for quick delivery. This is giving the commission merchants and jobbing houses a much better trade than usual. The Wire situation seems to be on the eve of an improvement. It is expected that the independent Wire manufacturers will soon get together and advance their prices.

**Pig Iron.**—Inquiries are numerous, but business is checked by the timidity of manufacturers, who feel themselves unable to take contracts for delivery during the next three or four months, because of the Coke scarcity. They have been so disappointed because of continued shortage of Coke that they are not disposed to take chances on their being able to either keep active furnaces in operation or start others which are now banked. Lake Superior Charcoal is in strong demand, particularly for use by Malleable foundrymen. Several sales of round lots are reported, and a great deal of business has been done in small lots. The foundries in the Northwest are now using much Charcoal Iron for ordinary castings because of the difficulty in securing Coke Iron. Commission merchants are doing an active business in the sale of carload lots of Southern Iron, which they are ordering from the furnaces and selling prior to arrival here. Some sales are reported by both Northern and Southern companies for delivery during the last half of the year. Nearly all Southern furnace companies have now advanced their prices to our maximum quotation. It is claimed that practically no Iron can be had at the inside figures. We quote as follows:

| | |
|---|---|
| Lake Superior Charcoal | $19.25 to $19.50 |
| Local Coke Foundry, No. 1 | 16.00 to 16.50 |
| Local Coke Foundry, No. 2 | 15.50 to 16.00 |
| Local Coke Foundry, No. 3 | 15.00 to 15.50 |
| Local Scotch, No. 1 | 16.00 to 16.50 |
| Ohio Strong Softeners, No. 1 | 17.60 to 17.85 |
| Southern Silvery, according to Silicon. | 16.15 to 16.40 |
| Southern Coke, No. 1 | 15.65 to 16.15 |
| Southern Coke, No. 2 | 15.15 to 15.65 |
| Southern Coke, No. 3 | 14.65 to 15.15 |
| Southern Coke, No. 1 Soft | 15.65 to 16.15 |
| Southern Coke, No. 2 Soft | 15.15 to 15.65 |
| Foundry Forge | 14.15 to 14.65 |
| Southern Gray Forge | 14.15 to 14.65 |
| Southern Mottled | 14.15 to 14.65 |
| Southern Charcoal Softeners, according to Silicon | 15.50 to 16.50 |
| Tennessee Silicon Pig | 16.40 to 16.65 |
| Alabama and Georgia Car Wheel | 19.50 to 20.50 |
| Malleable Bessemer | 17.00 to 17.50 |
| Standard Bessemer | .... to 17.50 |
| Jackson County and Kentucky Silvery, 8 per cent. Silicon | 17.60 to 17.85 |

**Bars.**—Specifications against contracts are very heavy, showing a high rate of consumption. Car builders and wagon makers are exceptionally active and are drawing large quantities of material. New business is excellent, fine orders having been placed for both Iron and Steel Bars since the opening of the new year. Manufacturers, in most instances, are now making quotations for immediate acceptance only, and will hold nothing open. The impression is strong that an advance is contemplated. Mill shipments are 1.65c. to 1.80c., Chicago, for Bar Iron or Soft Steel, and 2.05c. to 2.20c., base, for Hoops. Jobbers report an overwhelming business, which causes their stocks to move out as rapidly as they can be replenished. The demand for Bars is so strong that sales of carload lots have been made for shipment from store, on which full store prices have been obtained. Small lots are quoted at 1.90c. to 2c. for Bars, and 2.50c., base, for Hoops.

**Structural Material.**—The business of the week has consisted almost exclusively of small lots, but the demand is so heavy that the trade thus handled has aggregated a large tonnage. A building to take 1000 tons is now being figured on by the trade. The backwardness of the mills in making shipments is throwing a heavy trade on the local yards. A larger business than usual is thus being done by those who carry Structural Material in stock. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.05c.

**Plates.**—The mills are reported comfortably supplied with work, but in position to make fairly early shipments, thus keeping the trade in healthy condition. Jobbers are enjoying a somewhat better demand than usual at this season for orders to be delivered from stock. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c. to 1.95c.; Marine, 1.95c. to 2.05c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank, and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

**Sheets.**—The inquiry is stronger, but the number of independent mills has increased to such an extent that their competition for business is becoming noticeable. The regular price on mill shipments of No. 27 Black Sheets is 3.15c. to 3.40c., Chicago, but some concession is being made on these rates by independent mills, who are evidently not fully supplied with orders. A good demand is enjoyed by jobbers, but even for this class of trade the competition is growing a little sharper. Small lots of No. 27 Black Sheets are quoted at 3.50c., and Galvanized at 70 to 70 and 5.

**Merchant Pipe.**—The independent mills are growing more aggressive in pursuit of business with the larger buyers. This class of trade can therefore cover its requirements at somewhat easier prices than those hitherto prevailing. The carload price to consumers has not yet felt the effects of this competition. Carload lots are now quoted as follows, random lengths: Black, ⅛ to ½ inch, 60 off; ¾ to 10 inches, 67 off; Galvanized, ⅛ to ½ inch, 47 off; ¾ to 6 inches, 55 off.

**Boiler Tubes.**—An improved demand characterized the trade of the past week. Several transactions occurred which were of a character to test the market, and prices were found to be well maintained. Quotations are as follows:

| | Steel. | Iron. |
|---|---|---|
| 2¾ to 5 inches | 57½ | 47½ |
| 1¾ to 2½ inches | 50 | 40 |
| 1 to 1½ inches | 35 | 30 |
| 6 inches and larger | 52½ | 45 |

**Merchant Steel.**—The demand is good for the season. A particularly fine trade is now proceeding in Plow Steel and kindred specialties. The mills are not anxious for new business, having their capacity well engaged for the immediate future. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6¾c. for carloads and 7c. to 7½c. from store; Specials, 12c. upward.

**Rails and Track Supplies.**—The tonnage of Standard Rails now being booked is quite small, but this is owing to the sold up condition of the mills rather than the lack of demand. Inquiries for Rails are quite numerous and undoubtedly much more business would be doing if the mills could make desired deliveries. The tonnage of the week as far as reported was about 5000 tons, which went to Eastern mills. Heavy sections are quoted at $28, and Light Sections at $31 to $35. Fastenings are quoted as follows: Splice Bars, 1.70c. to 1.80c.; Spikes, 2c. to 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

**Steel Billets.**—A good trade is being done in small lots of Open Hearth Billets for forging purposes at $33 to $35, Chicago.

**Old Material.**—While the mills are not buying much Scrap at present, a good demand seems to be coming from some source sufficient to take up the offerings of railroad companies, and prices are firm. Old Steel Rails are higher. Cast Scrap is moving freely, foundrymen being liberal buyers. The following are approximate quotations per gross ton:

| | |
|---|---|
| Old Iron Rails | $21.00 to $21.50 |
| Old Steel Rails, mixed lengths | 14.75 to 15.00 |
| Old Steel Rails, long lengths | 20.00 to 20.50 |
| Heavy Relaying Rails | 25.50 to 26.00 |
| Old Car Wheels | 16.00 to 16.50 |
| Heavy Melting Steel Scrap | 13.50 to 14.00 |
| Mixed Steel | 10.50 to 11.00 |

The following quotations are per net ton:

| | |
|---|---|
| Iron Fish Plates | $16.00 to $17.00 |
| Iron Car Axles | 20.00 to 21.00 |
| Steel Car Axles | 18.00 to 18.50 |
| No. 1 Railroad Wrought | 15.00 to 15.50 |
| No. 2 Railroad Wrought | 13.25 to 13.75 |
| Shafting | 16.00 to 16.50 |
| No. 1 Dealers' Forge | 12.15 to 13.00 |
| No. 1 Busheling and Wrought Pipe | .... to 11.50 |
| Iron Axle Turnings | 11.25 to 11.75 |
| Soft Steel Axle Turnings | 10.50 to 11.00 |
| Machine Shop Turnings | 9.50 to 10.00 |
| Cast Borings | 5.00 to 5.25 |
| Mixed Borings, &c | 5.25 to 5.50 |

| | |
|---|---|
| No. 1 Boilers, cut | 11.00 to 11.50 |
| No. 2 Boilers, cut | 10.00 to 10.50 |
| Heavy Cast Scrap | 11.50 to 12.00 |
| Stove Plate and Light Cast Scrap | 9.00 to 9.25 |
| Railroad Malleable | 12.50 to 13.00 |
| Agricultural Malleable | 11.50 to 12.00 |

**Metals.**—The low price now ruling on Copper is becoming attractive to large buyers, and indications favor considerable business being done in the near future. Carload lots of Lake are now quoted at 12½c., and Casting brands at 12c. Pig Lead is unchanged at 3.95c. for Desilverized, and 4.05c. for Corroding, in 50-ton lots. A better business is doing in Pig Lead, as the requirements of consumers are heavy with the present active condition of general business. The trade in Old Copper and Brass is stagnant, as dealers and consumers are far apart in their views as to prices. It is possible that something could be done at about 11c. for Heavy Cut Copper, and 10c. for Copper Bottoms, but no sales are reported. Small lots of Old Pipe Lead are quoted at 3.80c., and Zinc at 2.75c.

**Coke.**—Spot Coke is bringing $6 to $6.50. The supply of Foundry Coke is a trifle better, as dealers are making every effort to secure shipments from Coke regions not ordinarily supplying this market. It is hoped that the shortage will soon be relieved, as great loss is resulting daily from this cause. Contracts for future delivery are being taken at $5 for 72-hour Foundry Coke.

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A. E. Rosenthal, general sales agent of the National Rolling Mill Company, has removed his office from the Northern Office Building to 740 Marquette Building, Chicago. The Merchant Bar mills of this company are at Hartford City, Ind. They are being enlarged at present by the addition of two double busheling furnaces, which will increase the output of the works 10 per cent. An 8-inch mill will probably be built in the spring.

## Philadelphia.

FORREST BUILDING, January 7, 1902.

The Iron markets are unusually strong, considering the conditions which have prevailed during the past several months. It is just possible, however, that there is not quite as much strength as there appears to be. The scarcity of Ores, the shortage of fuel and other influences have, in a measure, prevented a full production as well as a free movement of what has been produced, so that there is some danger of supposing that what is merely a temporary influence may be taken to be a recent great increase in demand. To some extent it amounts to the same thing practically, but as a matter of fact there is no great increase in the actual volume of business, Pig Iron being about the only article that is really and positively scarce. Famine conditions may be extended if Pig Iron continues as scarce as it is to-day, but there is a general impression that the supply of rolling stock will gradually increase and business get back to normal conditions.

**Pig Iron.**—It is almost impossible to define the Pig Iron situation with any satisfactory degree of certainty, as everything is at sixes and sevens owing to the difficulty of getting sufficient transportation facilities. Coke cannot be brought in in sufficient quantities; neither can Pig Iron be shipped out, so that there is a general scramble to get whatever there is. Prices under such circumstances are naturally very much unsettled and it is impossible to fix upon any standard at the present time, as each and every transaction is made on its own merits. For prompt shipments $16.75 to $17 is quoted for No. 2 X Foundry, and a number of sales have been made on this basis, but whether buyers will pay that for six months' deliveries or sellers accept less is a question still to be answered. Appearances lead to the impression that when a good buyer is willing to make a long time contract better terms can be had than the figures mentioned, but for a 60 or 90 day delivery it is not easy to secure concessions, and, as a matter of fact, some holders are disposed to be very cautious in quoting on large lots, as they are considering whether $18 Iron may not be seen before the end of March. Let it be understood, however, that there is no disposition to "boost" the market; it is merely a question of expediency, and neither buyers nor sellers at the present time have any very definite ideas in regard to what the final outcome is likely to be. All that they do know is that Iron is scarce and that sellers can get pretty nearly their own prices for prompt shipments. These vary from $16.50 to $17 for No. 2 X, but it is quite likely that more money will be asked before the week is out. Basic Iron is practically all taken up for the first half of the year, the nominal price to-day being about $16. For three to six months' contracts prices would be about as follows for Philadelphia and nearby points: No. 1 X Foundry, $17.25 to $17.50; No. 2 X Foundry, $16.50 to $17; No. 2 Plain, $16 to $16.50; Standard Gray Forge, $15.75 to $16; Ordinary Gray Forge, $15; Basic (Chilled), about $15.75 to $16, and Bessemer, $16.50 to $17.

**Plates.**—The demand is increasing and the mills are now very full of work, with excellent prospects for its continuance. A meeting of the Plate manufacturers is being held in New York to-day, but it is not expected that any change in prices will be made, although the advance in material appears to warrant some action of that kind. Pending further information prices remain as last quoted for Philadelphia and nearby deliveries: Universals, 1.75c. to 1.80c.; Sheared, 1.75c. to 1.80c.; Flange, 1.85c. to 1.95c.; Fire Box, 1.95c. to 2.05c.; Marine, 1.95c. to 2.05c.; C. H. No. 1 Iron, 2.40c.; C. H. No. 2 Flange, 2.90c.; C. H. No. 1 Flange Fire Box, 3.40c.

**Structural Material.**—There is no change whatever in this department. Mills are still very much behind with their orders and the chances for catching up are no better than before, as orders are coming in in larger volume than shipments are being made. Nominal quotations are as follows for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

**Bars.**—The demand for Bars is increasing and the mills find themselves considerably hampered by the difficulty in securing cars to move material either inward or outward. Prices remain the same as last quoted, but with the increased cost of Pig Iron and Scrap manufacturers feel that they are entitled to more money for the product, so that for the present quotations are firm at 1.67c. to 1.72c., delivered, for Iron Bars; Steel at 1.70c. to 1.75c.

**Sheets.**—There is quite a falling off in the demand and prices are a little easier, but prompt deliveries still command special rates. The general run of business, however, is at prices as follows, for deliveries during January and February in carload lots: No. 10, 2.40c. to 2.50c.; No. 14, 2.60c.; Nos. 16 and 17, 3c.; Nos. 18-21, 3.10c.; Nos. 26, 27, 3.30c. to 3.40c; No. 28, 3.50c.

**Old Material.**—The demand is very good and prices are a shade higher, and, with light offerings, prices appear to have an upward tendency. Bids and offers are about as follows for deliveries in buyers' yards: Low Phosphorus Scrap, $22 to $22.50; Choice Railroad Scrap, $20 to $21; Country Scrap, $16 to $17; No. 2 Light (Ordinary), $12.50 to $12.75; No. 2 Light (Forge), $14 to $14.75; Machinery Cast, $14 to $14.50; Heavy Steel, $18.25 to $18.50; Old Steel Rails, short lengths, $18.25 to $18.50; Old Iron Rails, $21.50 to $22; Wrought Turnings, $13 to $13.50; Cast Borings, $8 to $8.25; Old Car Wheels, $17 to $17.25; Iron Axles, $24 to $25; Steel Axles, $19 to $20.

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Arthur W. Howe and George T. Johnson, trading as Howe, Johnson & Co., at 719 Drexel Building, Philadelphia, have dissolved partnership by mutual consent, Arthur W. Howe retiring. The business will be continued at the same place by the remaining partner, under the firm name of George T. Johnson & Co., and all contracts and agreements made with Howe, Johnson & Co. will be completed by the new firm.

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The core makers employed in the foundries at Youngstown, Ohio, have formed a union and made a demand for a minimum wage rate of $2.50 a day, which was granted.

## Cleveland.

CLEVELAND, OHIO, January 7, 1902.

**Iron Ore.**—Contrary to general expectation, no meeting of the Ore Association has as yet been called for the purpose of fixing the prices for the year. It was generally assumed a week ago that the meeting would be held before January 10, but upon this score there seems to be no certainty. The belief current is that the matter will be cleared up before the middle of the month. As to the possible action of the association there is no change of opinion. The events all seem to tend toward the establishment of the same prices which prevailed during last year, and reported interviews with leading Ore producers confirm the same belief. No more sales of Ore have been made lately, but it is known that some deals are pending which may be closed before many days pass.

**Pig Iron.**—No change of conditions has brought relief to the Pig Iron situation during the week, but rather the Iron is getting more scarce. It is now known that over half of the furnaces in the Valley producing Foundry grades are banked and have been for several days, and the Coke supply is necessitating that others shut down. No one reports any Foundry Iron available for quick shipment, the best that can be done in almost any case being about two months. This situation has put the demand all out of proportion to the supply, and as a result the prices are climbing steadily. The Valley furnaces have increased their quotation to $16.50 and $16, respectively, on No. 1 and No. 2, and are not very anxious to make sales at that price. Southern Iron has been marked up this week, the quotations on No. 2 Foundry here being on the basis of $12 at Birmingham, with the $4.70 freight rate to Cleveland added. No big sales of this material have been reported, although it is known that the demand is more than equal to the supply. A peculiar situation has forced the producers of Bessemer and Basic off the market. Most of the furnaces are now sold up for some months to come and are not able to produce any Iron, because the supply of Coke is preventing them from operating. They have sold as far ahead as they care to make contracts on the existing prices and prefer to await the developments of the future before making any new quotations. This is particularly true of the Basic situation. Many of the furnaces are still out of blast and have not produced a ton in a month. With heavy bookings ahead at a variety of prices, the owners seem satisfied to await the developments of the market. They are refusing to make any quotations at this time, saying that the possible production of Iron is too uncertain, but say further that they would not accept $15.75, the price at which the last sales were made in the Valley. The market, however, has been very quiet, no big orders showing up during the week. The Bessemer situation is but little better. Nominally, the quotation of $16 still holds good, but no business has been done, principally because most of the material that the furnaces are likely to produce soon has been contracted for.

**Finished Material.**—A change in the car situation that is barely perceptible was reported during the week, and it is for the better. There are some reports that the situation will be entirely relieved by the first of next week, but upon what this report is based is not made known. There has been much clamoring among the manufacturers recently against the railroads, the claim being that they have not been doing their best, but have replaced careful management and quick handling of equipment with much bluster. Many other reports of an absurd nature have been afloat, but a careful analysis of the situation has brought out the fact that the Steel men are the victims of a chain of unfortunate circumstances, arising directly from such an enormous increase of the country's business that the railroads are not only short of cars and motive power with which to handle it, but the single tracked roads, which predominate, are actually short of the requisite track room over which to move the commerce presented. The delays incidental to such a situation have in due time affected the more favored industries, such as the Steel trade, and the results are now being felt in their severity. Some revolutionary changes in methods may be made soon that will probably bring some relief. In the meanwhile the shortage of cars is affecting the production of Steel. It is reported this week that five of the blooming mills of the Carnegie Company have been closed down because they could not get the material with which to work. This of necessity has brought about a shortage in the supply of Steel, upon which other plants have been depending. Generally, therefore, it might be said that the production of Steel in this section is seriously curtailed. In Bars, whether it be from a lessened production or an over buying, the market is getting very much stronger. The sales are increasingly in excess of production, and it is now reported that presently there will be as much difficulty in getting Bars as any other grades. The prices do not change in the least, Iron Bars bringing 1.50c., Pittsburgh; Bessemer Steel Bars bringing 1.50c., Pittsburgh, and Open Hearth Steel Bars bringing 1.60c., Pittsburgh. Sheets are also in good demand, the sales here being mostly out of store and quite heavy. In fact, the indications are so bright for business that many of the dealers are laying largely in store against the possible demand. Some gauges now are scarce, those especially of the middle sizes. The base price now is 3.35c. to 3.50c. in store for No. 27, one pass cold roll, with full cold rolled 10c. extra. A few small orders of Rails have been coming in during the week, but they are not large; but the market is strong. The quotation is unchanged at $28. Builders are still contracting ahead for Structural Material, even though deliveries now are seriously delayed by the car shortage, and on these contracts the old prices obtain of 1.70c. on Beams, Channels and Angles. The market has lost none of its strength in this respect. On Plates the situation is looking up a little. Universal Mill Plates are sold far ahead, and even Sheared Plate sales are gaining on the production very rapidly. The market is steady, at 1.70c.

**Old Iron.**—The Scrap trade has eased up considerably this week, and while there has been no reduction in the prices, it is apparent that the market is easier with a downward tendency. It is not expected that this will go to the extent of any slump, however. Quotations remain therefore as follows: No. 1 Wrought, $16.50 net. Cast Borings, $8 gross; Wrought Turnings, $12.25 gross; Cast Scrap, $13 net; Stove Plate, $10 net; Heavy Steel, $17 gross; Steel Rails, $17 gross; Old Iron Rails, $22 gross; Old Iron Axles, $19 gross; Old Car Wheels, $17 gross.

## Cincinnati.

FIFTH AND MAIN STS., January 8, 1902.—(*By Telegraph.*)

There has been no holiday respite in the Pig Iron trade this season. Selling has been continued right through the usual dull season on a very liberal basis. The amount of Iron sold has been gauged, in the main, by the amount of stock the different furnaces have had to offer, and deliveries are contracted covering well nigh the entire year. The amount of complaint, however, is something almost phenomenal. Sellers say that in years of business they have not had so much trouble to get Iron forward on old orders as they are having now. The past two months the car shortage has been distressing and there is no prospect of immediate relief. There are also an unusual number of furnaces shut down for one cause and another, and, then, Coke is very hard to get and labor suffering from what seems more than the usual holiday disarrangement. Altogether, were it not for the bright side of trade generally the situation would be a bad one. In prices there is hardly the uniformity that was presented a few weeks ago; the leading Southern interest still holds to the $11.50 base for No. 2, while other furnaces have advanced 50c. over that figure. The market is exceedingly strong and the outlook for activity as bright as it has been. Freight rate from the Hanging Rock district is $1.10 and from Birmingham $2.75. We quote, f.o.b. Cincinnati:

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|---|---|
| Southern Coke, No. 1 | $14.75 to $15.25 |
| Southern Coke, No. 2 | 14.25 to 14.75 |
| Southern Coke, No. 3 | 13.75 to 14.25 |
| Southern Coke, No. 4 | 13.25 to 13.75 |
| Southern Coke, No. 1 Soft | 14.75 to 15.25 |
| Southern Coke, No. 2 Soft | 14.25 to 14.75 |
| Southern Coke, Gray Forge | 13.25 to 13.75 |
| Southern Coke, Mottled | 13.25 to 13.75 |
| Ohio Silvery, No. 1 | 16.25 to 16.75 |
| Ohio Silvery, No. 2 | 15.75 to 16.25 |
| Lake Superior Coke, No. 1 | 16.60 to 17.10 |
| Lake Superior Coke, No. 2 | 16.10 to 16.60 |
| Lake Superior Coke, No. 3 | 15.60 to 16.10 |
| Southern Basic | .... to 14.75 |

*Car Wheel and Malleable Irons.*

| | |
|---|---|
| Standard Southern Car Wheel, chilling grades | $18.75 to $19.25 |
| Standard Southern Car Wheel, No. 2 | 17.75 to 18.25 |
| Lake Superior Car Wheel and Malleable | 18.50 to 19.00 |

**Old Material.**—The market is strong, active and higher. We quote dealers' buying prices, f.o.b. Cincinnati: No. 1 Wrought Railroad Scrap, per net ton, $15.25 to $15.50; Cast Railroad and Machine Scrap, $12.25 to $12.75; Iron Axles, $20.50 to $21; Iron Rails, $19.50 to $20; Steel Rails, rolling mill lengths, $15.75 to $16; short lengths, $13.75 to $14; Car Wheels, $16 to $17. All prices except No. 1 Wrought on the basis of gross tons.

## St. Louis.

CHEMICAL BUILDING, January 8, 1902.—(*By Telegraph*).

**Pig Iron.**—The year just closed will always stand unique in the minds of those interested in the Pig Iron market, and when reviewed incidents of interest and value are numerous. With all the active, heavy and urgent demand, a most conservative and sensible course has marked the governing of the market. Prices have advanced, it is true, but any idea of inflation has been checked. In looking over the tonnage figures the showing is a remarkable one, and many unusual transactions stand out. It has not been all smooth sailing, as many events have transpired to influence and unsettle the feeling in the market, such as strikes, car famines, &c.; but notwithstanding these hindrances it would seem that no one can complain with the general outcome. Iron is scarce now, and a glance at the report of stocks on hand at the furnaces warrants this statement. Heavy tonnage has marked the opening days of the year, and since our last report an advance of 50c. per ton in all grades has been put into effect. Better than 30-day deliveries are out of the question, and then the tonnage of such shipments is necessarily small. Practically all the furnaces are sold up for the first three months, and heavy requirements are booked through the first half. Several contracts are to be noted covering requirements for the last half of the year. It is said that the transportation feature shows slight improvement. We quote as follows for cash, f.o.b. St. Louis:

| | |
|---|---|
| Southern, No. 1 Foundry | $16.00 to $16.25 |
| Southern, No. 2 Foundry | 15.25 to 15.50 |
| Southern, No. 3 Foundry | 14.75 to 15.00 |
| Southern, No. 4 Foundry | 14.25 to 14.50 |
| No. 1 Soft | 15.75 to 16.00 |
| No. 2 Soft | 15.25 to 15.75 |
| Gray Forge | 14.25 to 14.50 |

**Bars.**—The volume of demand and inquiry in the market for Iron and Steel Bars continues very heavy, and the difficulty is for the mills to keep pace with the requirements of the trade. Jobbers report a very strong condition, and it is said a larger trade is being done at this season of the year than heretofore. We quote from mill: Iron Bars at 1.70c. to 1.80c.; Steel Bars at 2c. Jobbers quote Iron Bars at 2c.; Steel Bars at 2.10c., full extras.

**Rails and Track Supplies.**—In ushering in the new year the Rail trade can do it with the surety of plenty of business at least for the 12 months before them, as we were able to point out the booking of the entire year's production of the mills in our reports some time ago. Track Supplies have a share in a marked degree of the condition prevailing in other departments of the market, and no complaint is to be heard regarding the indications for the future. We quote: Splice Bars, 1.75c. to 1.95c.; Bolts, with Square Nuts, 2.75c. to 2.90c.; with Hexagon Nuts, 2.90c. to 2.95c.; Spikes, 2c. to 2½c.

**Pig Lead.**—A more settled condition is to be noted in the Pig Lead market, and sales on the basis of 3.90c. to 3.92½c. for Missouri brands can be reported.

**Spelter.**—The Spelter market has lapsed into quietness, and prices have sagged off to some extent. Quotation of 4.12½c. to 4.15c. about covers the level at this time.

**Angles and Channels.**—The market for Small Angles and Channels is showing considerable activity, and the demand and inquiry is reported to be very satisfactory. Jobbers quote at 2.30c., base, for materials of this class.

**Sheets.**—At the opening of the new year the market for Sheets is showing a stronger and more active condition, with prices holding at former level. Jobbers quote Stove Pipe size, No. 27, 3.45c. to 3.50c.; Galvanized Sheets, 65 and 10 off, and in round lots 70 to 70 and 5 off.

## Pittsburgh.

HAMILTON BUILDING, January 8, 1902.—(*By Telegraph.*)

**Pig Iron.**—Deliveries of Coke on Monday and Tuesday to the furnaces were much better than for some time and it looks as though the worst of the trouble might be over. At present only four or five stacks in the Valleys are crippled for want of Coke. Standard Bessemer Iron is firm at $16 at furnace, and a leading Steel interest bought about 9000 tons at this price. In all probability 15,000 tons have been sold. There is some inquiry for Forge Iron and it is firm at $16 to $16.25, Pittsburgh. We note a sale of 2000 tons at $16.10, delivered here. Foundry Iron for first quarter can hardly be had at any price, as the furnaces are so well sold up they have very little Iron to spare. We quote Standard Bessemer Iron, $16, Valley, or $16.75, Pittsburgh. Gray Forge is $16 to $16.25, and No. 2 Foundry, $16.50 to $16.75, Pittsburgh.

**Steel.**—The market is quiet, and little lots of prompt Steel are still held at $27 to $28, at mill. The Steel market is in the condition that the large consumers are covered by contracts on a sliding scale basis, and very little Steel is sold in the open market. Many small consumers will build Open Hearth furnaces this year and make their own Steel.

(*By Mail.*)

Every day the situation in the Iron trade grows stronger and the difficulty to get prompt material is greater. It is really not a question of price on almost any kind of material that can be named, but where to get it. This condition is the result of the car shortage, the banking of furnaces because of inability to get Coke, and a greater decrease in output of Steel and all kinds of material. Foundries all over the city are running light handed, not able to get Coke and Pig Iron, and while the claim is made by the railroads that the car situation is better, yet the cold fact remains that it is still about as bad as it possibly could be. It is probable that a little more Coke is going into the furnaces in Pittsburgh and the Valleys, but, on the other hand, as high as $3.50 a ton is being paid by blast furnaces for Coke, in preference to shutting down. No heavy sales of Pig Iron have been made in the past few days, as the furnaces do not care to take on additional tonnage until the car situation and supply of Coke is better. There is a good deal of inquiry for both Bessemer and Forge and some of the large interests are really in distress for metal. There have been sales during the week of a good deal of Foundry Iron, mostly for delivery in second half of this year. Steel continues very scarce and is bringing $27 to $28 in small lots for prompt shipment. Finished Material is strong and demand good. In Sheets the recent weakness in prices seems to have entirely disappeared and the market is again very firm. There is not a cloud in the business horizon that would indicate that present conditions are not going to last throughout the whole of this year.

**Muck Bar.**—The higher price and scarcity of Gray Forge Iron has stiffened up the Muck Bar market a good deal and we quote standard grades at $29.50, delivered at buyer's mill. A sale of 500 tons is reported at this price.

**Iron and Steel Bars.**—We note a continued heavy

demand for both Iron and Steel Bars, and most of the mills are filled up with work for the next month or six weks. Tonnage last month was larger than usual for December, and the outlook is that January will be still heavier. Association prices on both Iron and Steel Bars are, we are advised, being firmly held. We quote Iron and Steel Bars at 1.50c., at mill, in carloads and larger lots. For Open Hearth Steel $2 a ton extra is charged. Some of the leading Steel Bar mills have adopted a schedule of extras on Steel Bars in small lots, as follows: Under 2000 pounds to 1000 pounds, 5c. advance; under 1000 and more than 500 pounds, 15c.; less than 500 pounds, 25c. advance. Steel Hoops are 1.90c., base, in carloads, and 1.95c. in less than carloads, f.o.b. mill. For small lots and prompt shipment higher prices are charged. Steel Bands, 12 gauge and heavier, are sold on the Steel Bar card and carry the half extras.

**Cotton Ties.**—The American Steel Hoop Company have announced prices on Cotton Ties for this season's delivery as follows: 80c. per bundle in 10,000 bundle lots and over, 83c. for less than 10,000 and more than 2000 bundles, 86c. for 2000 bundles and less. These prices are f.o.b. mill, Pittsburgh; full freights added to price at points of delivery. These prices are for delivery prior to April 1, 1902, and ½c. per bundle extra per month will be charged for deferred deliveries. These prices are a reduction of 2c. a bundle from the prices nominally ruling during the strike last summer and are the first quotations made on Cotton Ties for this season's crop.

**Rails.**—It is reported that the Mexico tonnage, about 140,000 tons, has been placed abroad, but this is not confirmed. No large orders have lately been placed, but the mills are sold ahead for a long period. We quote at $28, at mill, for Standard Sections.

**Ferromanganese.**—We quote 80 per cent. domestic Ferro at $52.50, delivered in large lots. Foreign Ferro continues to be offered in this market in round lots at $50 a ton, delivered.

**Plates.**—Tonnage has improved considerably and the outlook is that business will improve right along. Specifications on old contracts are coming in, and a good deal of new tonnage has been placed. The Standard Steel Car Company, who will build a plant in this city for making Steel cars, will take 300 to 400 tons of Plates per day. Prices are rigidly held and we quote: Tank Plate, ¼ inch thick and thicker, up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

**Structural Material.**—A great deal of local work is coming up. Included in this is a 12-story steel frame building for the Kelly & Jones Company, on Water street, about 1500 tons; the prospective Oliver office building, about 10,000 tons, plans for which are being made by a Chicago architect; the Dilworth, Porter & Company new buildings and other smaller jobs. The Hamilton Bridge Company, at Hamilton, Ontario, Canada, recently placed a large tonnage with a local mill. Many modern bridges are being built in Canada, and much of the material goes from the Pittsburgh mills. Report has it that the Government of New Zealand will place contracts for steel bridges in this country, which means a large tonnage to be furnished by our structural mills. Some large contracts, both East and West, have recently been placed, and the mills are full of work for the next two or three months. Material is so scarce that small concerns who carry Beams in stock can get from 2c. to 2½c. a lb. for them. The association is not likely to make any change in prices for some time, but the condition of the market would fully warrant higher figures. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

**Rods.**—Prices on Rods are somewhat higher, and we quote ordinary Bessemer Rods at $32.50 to $33, Pittsburgh. It is said some sales of Rods have been made at very close to the latter figure.

**Merchant Steel.**—A good deal of tonnage is being placed, and the mills are full of work. Prices on some kinds of Material are slightly higher. We quote: Tire Steel, 1.70c. to 1.75c.; Toe Calk, 1.90c. to 2c.; Hammered Lay Steel, 3.75c. to 4c.; Open Hearth Spring, best quality, 2.50c. to 2.60c.; ordinary Sleigh Shoe, 2c. to 2.25c.; Sleigh Shoes, tapered and bent, 2.75c. to 3c.; Tool Steel, 6½c. and upward. On Tool Steel freight is allowed to points east of the Mississippi River.

**Sheets.**—The scarcity and high prices of Steel, together with the fact that tonnage in Sheets always increases in the first two or three months of the year, has given the market a decidedly stronger tone, and some comparatively low prices made by some of the outside mills have been withdrawn. Some large contracts for Sheets for extended delivery have been made on the basis of 3c. to 3.10c., maker's mill, for No. 28 Black Sheets, one pass through cold rolls. No. 27 in round lots are held at 2.90c. to 3c., minimum. For small lots jobbers get from 10c. to 15c. advance over these prices. Galvanized Sheets are held at 70 and 10 off in large lots for extended delivery, and 70 and 5 off for carloads and 70 off in small lots.

**Merchant Pipe.**—A fair amount of tonnage is being placed, but some of the new Pipe mills that will soon be ready to run are actively soliciting orders through brokers and other channels, and there is some unevenness in prices on certain sizes of Merchant Pipe. Prices to consumers in small lots are as follows:

| *Merchant Pipe.* | Black. Per cent. | Galvd. Per cent. |
|---|---|---|
| ⅛ to ½ inch and 11 to 12 inch | 61 | 48 |
| ¾ to 10 inch | 68½ | 56 |
| *Casing, Random Lengths.* | S. & S. | I. J. |
| 2 to 3 inch | 58 | 53½ |
| 3½ to 4 inch | 63 | 59 |
| 4½ to 12½ inch | 65 | 61½ |
| *Casing, Cut Lengths.* | S. & S. | I. J. |
| 2 to 3 inch | 53½ | 59 |
| 3½ to 4 inch | 59 | 55 |
| 4½ to 12½ inch | 61½ | 57½ |

Prices to jobbers are from 7½ to 10 per cent. lower than the above, depending on amount of tonnage and time of delivery.

**Skelp.**—There is practically no market on Skelp. Only nominal quotations can be given, which are as follows: Grooved Iron Skelp, 1.70c. to 1.75c.; Sheared, 1.75c. to 1.80c.; Grooved Steel Skelp, 1.75c. to 1.80c., and Sheared, 1.80c. to 1.85c. These prices are merely nominal and on a firm offer would likely be shaded.

**Boiler Tubes.**—There is a heavy demand, and mills are as far behind on deliveries as ever. Prices to consumers are as follows:

| *Boiler Tubes.* | Up to 22 feet. Per cent. |
|---|---|
| Steel. | |
| 1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive | 65½ |
| 2 inch to 2½ inch, inclusive | 60 |
| 6 inch and larger | 59 |
| Iron. | |
| 1 inch to 1½ inch and 2½ inch | 43½ |
| 1¾ to 2¼ inch | 43 |
| 2¾ to 13 inch | 53 |

**Connellsville Coke.**—Output of Coke in the Connellsville region last week showed a heavy falling off, being only 170,241 tons, a decrease of over 62,000 tons over the previous week. Shipments were 8565 cars. The heavy decrease in output was due to the fact that a large number of ovens have been blown out, as cars cannot be had in which to ship the Coke. Fabulous prices are being paid for both Furnace and Foundry Coke for prompt shipment, and reports are that Furnace Coke has sold up to $3.50 and $3.75 a ton. On contracts for delivery all through this year we quote strictly Connellsville Furnace Coke at $2.25 a ton and 72-Hour Foundry at $2.75 to $3 a ton. Main Line Furnace Coke is $2 to $2.15 on contracts and Foundry $2.25 to $2.50 a ton. It is said that Foundry Coke has sold at $3.50 a ton on contracts where the seller would guarantee shipments.

**Iron and Steel Scrap.**—A contract for a large tonnage of Skelp Ends, about 10,000 tons, and for delivery

all through this year, was to have been closed to-day (Tuesday), at 10 a.m., but has been postponed for one week. There is quite a competition among Scrap dealers to get this material, which is very desirable, and it is said the price bid this year is about $3 a ton higher than was paid last year. So many Basic Open Hearth Steel plants are being built that Steel Scrap is becoming very scarce and is bringing high prices. We quote Heavy Melting Stock at $17 to $17.50, gross ton; Bushеling Scrap, $13 to $13.50; No. 1 Wrought, $17 to $17.50; Old Iron Rails, $22 to $23.

## New York.

NEW YORK, January 8, 1902.

**Pig Iron.**—Additional quantities of Foundry Iron have been purchased by some of the larger interests. The scarcity of Pig Iron for immediate delivery is becoming more pronounced. A small lot of foreign Bessemer Pig has been bought for immediate importation. It is expected that to-day the price of Southern Pig Iron will be generally made $12, Birmingham, for No. 2. We quote for Northern Irons: No. 1, $16.50 to $17.50; No. 2 X, $16 to $16.50; No. 2 Plain, $15.50 to $16; Gray Forge, $15 to $15.25; Tennessee and Alabama brands, No. 1 Foundry, $16.25 to $16.75; No. 2 Foundry, $15.75 to $16; No. 1 Soft, $16.25 to $16.75; No. 2 Soft, $15.75 to $16; No. 3 Foundry, $15.25 to $15.50; No. 4 Foundry, $14.75 to $15; Gray Forge, $14.50 to $14.75.

**Cast Iron Pipe.**—The Philadelphia order was closer to 13,000 tons. There is now in the market an inquiry for 3750 tons for Jersey Shore, Pa., and round lots for Philadelphia and Newark. Some of the shops show an inclination to hold back. We quote $23.50 to $24 per ton at tidewater.

**Steel Rails.**—It is understood that the tenders for the Mexican orders are in, but that the contracts have not yet been awarded. It is stated that the demand for Rails for trolley lines was very heavy last year, and that it promises to constitute a very important factor this year. We continue to quote $28 at Eastern mill for Standard Sections.

**Finished Iron and Steel.**—The number of new structures of magnitude which are coming up in this district continues very large and the tonnage in sight is very heavy. Prices are quoted as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.78c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1, 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.65c.; Soft Steel Bars, 1.70c.

## Metal Market.

NEW YORK, January 8, 1902.

**Pig Tin.**—A weak and declining market characterized the week under review. Business was very slight. The lowest point was reached yesterday, when spot sold at 22½c. London also quoted a further decline, with £100 5s. for spot and £98 for futures. At the close to-day London was somewhat firmer, spot being quoted £102 15s., and futures £100. The Billeton sale held at Batavia to-day went at an equivalent of £100, c.i.f. Holland. Prices here were as follows at the close to-day: Spot to March 22½c. to 23c., April 22.30c. to 22.75c.

**Copper.**—The market is still very much unsettled. Last Friday prices suffered another "official" decline. Lake was cut to 12⅛c., Electrolytic 12c. and Casting 11½c. Since then there has been no change in the quotations, but outside producers shaded them to the extent of ¼c. on Electrolytic and ½c. on Casting. Purchases are only of a retail character. The trade are in constant expectation of further reductions. The opinion is that the present price is at least 2c. above the bottom price. It is stated on good authority that the Calumet & Hecla interests have not made a price since the declining has commenced. London reached the lowest with £47 for spot and £54 for Best Selected. At the close to-day London cabled £47 10s. for spot and £47 17s. bid for futures. Best Selected was quoted £55. Following is the table of annual Copper statistics, as compiled by the New York Metal Exchange, in gross tons:

| | 1901. | 1900. | 1899. |
|---|---|---|---|
| *Supplies.* | | | |
| *Domestic production, as per producers' returns | 266,452 | 268,787 | 262,206 |
| Net importations of foreign | 61,286 | 38,182 | 39,858 |
| Total supplies | 327,738 | 306,969 | 302,064 |
| *Exportations.* | | | |
| Exports of domestic to Europe | 92,408 | 151,988 | 112,637 |
| Exports of domestic to British North America | 616 | 688 | 435 |
| Exports of domestic to Mexico | 85 | 151 | 130 |
| Contents of sulphate | 5,338 | 4,852 | 2,392 |
| Total exportation | 98,447 | 157,679 | 115,594 |
| Deducting exportations from supplies, there were available for home consumption | 229,291 | 149,290 | 186,470 |

* Domestic production for December estimated.

**Pig Lead.**—There was no change in the situation here. Business was very light at unchanged prices. The quotation of the American Smelting & Refining Company for Desilverized is 4c. New York and 3.95c. St. Louis. London advanced 6 shillings 3 pence, closing today at £10 10s.

**Spelter.**—The markets here and in St. Louis were firmer as to spot. The price quoted here for spot was 4.30c. to 4.35c., and at St. Louis 4.15c. was quoted. The London market has been declining steadily, the closing quotation to-day being £16 10s. This figure is 5 shillings lower than last week's quotation.

**Antimony**—Is unchanged, Hallett's being quoted at 8¼c., Cookson's 10¼c., and outside brands 7¾c to 8c.

**Nickel**—Is unchanged, contract prices continuing on a basis of 60c.

**Quicksilver**—Has declined considerably, both in London and in this market. Present prices are on a basis of $48.50 per flask of 76½ lbs. in lots of 50 flasks or more. London declined to £8 15s.

**Tin Plates.**—The American Tin Plate Company are now quoting for the second quarter of this year. Prices are still on a basis of $4.19 per box of standard 100-lb. Cokes, f.o.b. New York, and $4, f.o.b. mills. Business is active.

## OBITUARY.

JOHN G. SADLIER.

A discharged employee shot and instantly killed John G. Sadlier of Springfield, Ohio, one of the best known foundrymen in America, on the 6th inst. Mr. Sadlier was elected president of the American Foundrymen's Association at their last convention, held at Buffalo last June. He was vice-president and general manager of the Springfield Foundry Company of Springfield, Ohio, and also of the Fairbanks Machine Tool Company. He was also manager of the Indianapolis Switch & Frog Company of Springfield. It was at the office of the latter concern that Mr. Sadlier met his death. He was born at Johnstown, Pa., in 1856. At the age of 12 he entered the foundry of the Cambria Iron Company as an apprentice. Shortly after he had served his time at the Cambria foundry he entered the employ of the Morgan Engineering Company of Alliance, Ohio, and was made foreman of the foundry. Later he became foreman of the foundries of the Walker Mfg. Company of Cleveland, William Tod Company of Youngstown and the Sharon Steel Company. He then became a member of the Springfield Foundry Company, assuming charge of the entire plant. Ever since the organization of the American Foundrymen's Association Mr. Sadlier had been an enthusiastic member of that organization. He always took an active interest in the papers and discussions at the conventions of the foundrymen, and showed particular interest in the subject of maintaining pleasant relations between the employer and the employee. At the recent Buffalo Convention Mr. Sadlier presented a paper, entitled "The Problem of the Molder," in which he advocated kind treatment and the education of the men.

# The New York Machinery Market.

NEW YORK, January 8, 1902.

Hopes and prophecies were more than fulfilled by the manner in which business opened the new year. Though the first week in the year is usually included in the period set aside for taking inventory, nevertheless the opening week of this year showed no evidence of postponement of business on this account. In several large machinery houses it was said that the mail was never before so heavy as it was last week. More important, however, was the statement that a good proportion of the correspondence closed up transactions that had been pending for some time. The inquiries received were also said to be very good. There was a renewal of inquiries which were originally received so far back into last summer that they had almost been lost sight of. Transient business was good in such smaller classes of machinery as are carried in warerooms and warehouses.

On the whole, general business was excellent, even when subjected to the test of comparison with the very busy weeks which the machinery trade have experienced during most active periods. A very healthful sign was to be witnessed in the fact that there was practically no changing in prices whatever. It is not an uncommon occurrence in times such as these, when machinery builders generally are well supplied with work and conditions point to a continuance of brisk trade, to see the manufacturers take advantage of the situation and send prices upward. The first of the year is usually considered an opportune time for doing this. That manufacturers have refrained from availing themselves of this opportunity is commended in all quarters, as it is held that stability of values is more desirable at this time than a rising market.

### Machine Tools.

In this branch of the trade activity was pronounced. At least two of the very extensive transactions which have been on the verge of consummation for a number of weeks have now commenced to materialize. A portion of the forthcoming orders have been placed, but the deals have not yet been closed entirely. One of the projects referred to is said to be in connection with railroad work. The Baldwin Locomotive Works have closed a considerable quantity of business since the first of this year. As previously stated, this concern have been buying heavily for some time. It is now stated that during the last year upward of $400,000 worth of machinery was purchased by this concern. It is reported that they have just placed an order for 25 Cincinnati planers. They have previously purchased all the available machines of this type in this market. A recent order in this connection was awarded to the L. W. Pond Company of Worcester, Mass., and called for some eight large machines.

It seems that the extension of the plants controlled by the American Locomotive Company is continually growing. The latest official announcement is that $2,000,000 will be expended in improving these various shops. The company have recently purchased a very large amount of equipment, notably for the Schenectady plant, which is to have a capacity of 1000 locomotives annually. The efforts will now be made in the direction of the other plants.

The National Enameling & Stamping Company have decided to rebuild the Haberman plant in Brooklyn, which was recently destroyed by fire. As previously noted, the directors of the company were questioning the advisability of rebuilding this plant or adding to the one at Berlin Village, L. I. Their decision to rebuild indicates that the work will commence as soon as plans are drawn by Architect Saul Richman of Laurel Hill, L. I. A large amount of machinery will be required. The principal offices of the company are located at 81-83 Fulton street, New York.

Powell & Turner of Troy, N. Y., builders of the New Century street railway truck, are arranging for the increase of their capital stock to the extent of $50,000, for the purpose of building new works or enlarging their present plant.

Elmer E. Stanton of 257 River street, Troy, informs us that equipment will probably be purchased in about a month.

About $25,000 will be expended by the Warsaw-Wilkinson Company of Warsaw, N. Y., for the purchase of a plant for building agricultural implements. There will be two steel frame buildings, 50 x 264 feet, and a foundry. The company have been incorporated with a capital of $100,000. W. C. Gouinlock is the president.

A large amount of equipment is being purchased by the newly organized Union Construction & Dry Dock Company of Norfolk, Va. The concern propose building a floating dry dock, which will have a capacity of from 1000 to 2000 tons. A foundry and machine shop will be erected, and it is also intended to build a boat shop and spar department. Charles T. Dean, the secretary and treasurer of the company, informs us that it is intended to have the plant completed in six months.

The Lehigh Foundry Company, 141 Broadway, New York City, will have completed the rebuilding of their foundry, at Fullerton, Pa., in about three months, when some further purchases of equipment will be made. The plant of the Bethlehem Foundry & Machine Company, at South Bethlehem, Pa., is to remain where it is. F. Conlin being manager of both plants, led to the erroneous report that the Bethlehem Company were to remove to Fullerton.

### Power Plants.

We are officially informed that the work of erection of the great power station planned by the Third Avenue Railroad Company of New York is now to proceed. It will be recalled that plans were prepared for this plant, and a blanket contract was awarded to Westinghouse, Church, Kerr & Co. of 26 Cortlandt street, New York. Shortly after the awarding of this contract the railroad company went into the hands of a receiver. Subsequently the Metropolitan Traction Company secured control of the company by purchasing the stock in the open market. The great new Metropolitan power station was then under way and the electrical energy required in operating the Third Avenue lines was derived from this station. Consequently work on the erection of the Third Avenue power house was deferred. This work will now be resumed. The ultimate capacity of this station, as planned and contracted for, is 96,000 horse-power. There will be 16 engines, each to have an ultimate capacity of 6000 horse-power, and a nominal capacity of 4000 horse-power. It has been decided to install half of this apparatus immediately. The remaining half will be installed at a later date. Westinghouse, Church, Kerr & Co. will purchase all of the accessories required. The engines will be furnished by the Westinghouse Machine Company, and the electrical apparatus will, of course, be furnished by the Westinghouse Electric & Mfg. Company.

Westinghouse, Church, Kerr & Co. are now purchasing the accessories required in the equipment of the power station and road of the Lehigh & Wyoming Valley Electric Railroad. The principal apparatus to be purchased consists of feed water heaters, condensers, pumps and steam specialties, as well as railroad appliances, cars, &c.

It has been decided to rebuild the plant of the Champion Coated Paper Company of Hamilton, Ohio, which was recently destroyed by fire. Westinghouse, Church, Kerr & Co. have the contract for this work, and will conduct the necessary purchases.

The B. F. Goodrich Company of Akron, Ohio, have just placed orders with the Westinghouse Machine Company for two Westinghouse-Parsons steam turbines. One will be of 750 kw. capacity and the other 450 kw.

The Winchester Repeating Arms Company of New Haven, Conn., have just installed two 250 horse-power Westinghouse gas engines. They are now installing a gas producer plant to furnish the fuel for the engines. This is the first extensive plant of this type which has come to our notice, and will furnish an excellent test case.

The boiler plant of the Manchester works of the British Westinghouse Company is to be equipped with Roney mechanical strokers. The first order, which calls for 1500 horse-power, has just been placed.

McClave, Hamilton & Rimmer, of 85 Liberty street have received an order from the Sandusky, Monroeville, Norwalk & Bellevue Traction Company of Philadelphia for two 200 kw. tandem compound engines direct connected to generators.

Charles H. Paine, representing the Taunton Locomotive Mfg. Company, with offices at 85 Liberty street, has just received an order for 4000 horse-power primary and secondary feed water heaters from the General Electric Company. The apparatus is to be installed in the new power station of the Tokio Elevated Tramway Company of Tokio, Japan.

The West Virginia Pulp & Paper Company have placed an order with W. F. Downs of 74 Cortlandt street for 6000 horse-power of fuel economizers. The apparatus will be built by the Green Fuel Economizer Company of Matteawan, N. Y.

**Naval Supplies.**

The Bureau of Supplies and Accounts, Navy Department, advertise for bids to be opened January 14 for furnishing supplies for the Mare Island Navy Yard: The following machinery is included:

Class 30. One reversible steam winch.
Class 31. One 36-inch quick acting shear.
Class 32. One 16-inch quick acting punch.
Class 33. One universal splitting shears.
Class 34. One horizontal combined punching and shearing machine.
Class 35. One 2-inch water press.
Class 36. One 1½-bolt heading machine.
Class 37. One 50-inch vertical drill press.
Class 38. One 24-inch vertical drill press.
Class 39. One 6-inch full universal radial drill.
Class 40. One radial countersinking wall drill.
Class 41. One universal cutter and tool grinder.

The Navy Department has called for bids to be opened January 14 for furnishing the following supplies for the Puget Sound Navy Yard:

Class 1. For the installation of a steam heating system in the general storehouse.
Class 2. One locomotive steam crane.
Class 7. One 5 horse-power motor.
Class 8. One stationary stop engine, with automatic governor.
Class 9. One back geared screw cutting engine lathe.
Class 10. Modern tool room lathe with compound rest and taper attachment.
Class 11. One 16-inch triple quick return crank shaper.
Class 12. One 2½-inch combination radial drill.
Class 13. One combination punch and shearing machine.
Class 14. One 14-inch sensitive drill with square and box tables.
Class 15. One power grindstone complete with stone dressing attachment.
Class 16. One bench emery grinder.
Class 17. One twist drill grinder for grinding drills from ⅛ to 2¼ inch.

Bids will also be opened on January 14 for one shaper for installation in the navy yard at Boston.

The Holland Torpedo Boat Company of Elizabethport, N. J., are desirous of obtaining catalogues from manufacturers of and dealers in machine tools and supplies.

The Manhattan Railway Company, New York City, have adopted the Siegrist oiling system for the distribution of both engine oil and cylinder oil to their main engines, exciter engines and condensers in their new 100,000 horse-power station, Seventy-fourth street and East River, this city. The same system was recently purchased for the Glasgow Tramways Station, Glasgow, Scotland, also De Beers Consolidated Mines, Limited, Kimberley, South Africa. J. H. Siegrist,, Jr., Company, 253 Broadway, is Easteren representative for this system.

The Fulton Iron Works Corliss engines will be used by the East St. Louis Electric Railway Company for their new power station. J. H. Siegrist, Jr., 253 Broadway, this city, is Eastern representative.

A. F. Bartlett & Co. of Saginaw, Mich., have just issued a list of second-hand machinery which they have in stock. The stock consists of engines, boilers, saw mill, shingle, stave, hoop and lath mill machinery. The list also includes a number of specialties for which the company are selling agents.

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The Croton Limestone Company have been organized at New Castle, Pa., with a capital of $30,000. One of the incorporators is W. Thompson of the Republic Iron & Steel Company.

## The Chicago Machinery Trade.

All branches of the Chicago machinery trade were phenomenally active in December. Houses not finding it the largest month in their history are the exception. The demand was of a general character. The peculiar feature of the present activity is the absence of a predominating influence in the trade. In past periods of heavy buying it has usually happened that some particular manufacturing business was enjoying heavy growth, thus causing the enlargement of factories devoted to that specialty. The machinery market now is peculiarly devoid of any such controlling element. The growth of business is thus proceeding on broad grounds, and on such a substantial basis as to speak well for its continuance. Possibly two lines that may be singled out, in which particularly strong development is proceeding, are the manufacture of railroad supplies and the electrical trade. The railroads are enjoying such a remarkable era of heavy traffic and great earning power that they are extensively purchasing all kinds of supplies, and in this way are stimulating all branches of business in their connection. The development of the electrical trade is not new, but merely a continuance of past conditions, which are now becoming more pronounced. The manufacturers of dynamos and motors are exceedingly busy, and, finding their facilities overtaxed, are arranging to supply a still heavier demand for their products. The manufacturers of electrical specialties are also steadily increasing their business, especially the manufacturers of telephones. The telephone business has grown of late by leaps and bounds. This is giving all the manufacturers of apparatus connected with telephones an enormous trade.

A great deal of machinery business has originated the past year in Milwaukee, and much more is expected from manufacturers in that city. The quantity of machine tools they purchased in the past six months is believed to have been very much larger than the purchases made in the same line by the manufacturers of any other single city in the country. So many large machinery establishments are now building, and so many new factories are projected in Milwaukee, that the trade of that city is running up to an enormous aggregate. At the same time the erection of new factories and the enlargement of old ones has been proceeding at a great rate of growth in nearly every Western town in which manufacturers have a foothold. It is believed that Western cities and towns have shown much greater progress in this respect than Eastern cities. These developments all have a strong influence on the growth of the machinery trade in Chicago, which not only made a new record last year, but promises to equal, if not exceed it, this year.

Prominent among recent large buyers of machinery have been the Marine Iron Works of Chicago and the Elkhart Bridge Company of Elkhart, Ind. The Marine Iron Works are rebuilding their plant recently destroyed by fire, and have purchased a large outfit of engine building tools from the Niles Tool Works Company as well as some from McDowell, Stocker & Co. The Elkhart Bridge Company are preparing to enter the field as bridge builders, and are fitting up a good sized plant for that purpose. They also purchased a large number of tools from the Niles Tool Works Company.

**Gas Engines.**

The extraordinary activity in the gas engine business, which has been a feature of the machinery trade for some considerable time, still continues. The manufacturers of such engines as are recognized as standard in this line are so crowded with work that new engine building companies are having no difficulty in securing enough business to keep their works employed to full capacity, even in cases in which the efficiency and economy of the engines turned out have not yet been thoroughly demonstrated. Buyers are taking their chances in matters of this kind, and it is expected that some of them will be seriously disappointed in not securing as good results as had been expected. A large trade in gas engines is coming from the natural gas districts of the West, as the users of power in those districts are now disposed to abandon the consumption of gas in raising

steam, because of the necessity of economizing in this respect, owing to the diminution in the gas supply. They find that for a given power the consumption of gas in operating a gas engine is only about one-fourth of the consumption which would be necessary in raising steam. The tendency is steadily toward the use of larger units. Here, however, it is found that when a great deal of power is needed it is desirable to split it up into a number of units rather than to depend on one or two gas engines of very large size. Advantages are found in this respect which tend to economy, especially in furnishing power for operations involving a shifting load. The use of a number of units is growing in favor in the generation of electric power, as gas engines can be thrown into or out of operation so readily as to enable the power to be almost instantly increased or diminished, according to the varying requirements of the work to be done.

**General Machinery.**

The Allis-Chalmers Company, Chicago and Milwaukee, report their business never better than at present. The demand for large engines continues phenomenal, steadily running to heavier units. Heavy contracts for engines were booked in December, and inquiries are still being received for others. The company's Gates Iron Works never had so many orders in hand for rock and ore crushers as at this time. Mining machinery generally has been in such strong demand that this department of their business is overwhelmed with work. They find that the great activity now prevailing is almost wholly due to business coming from domestic sources. They have had good orders recently from Mexico and Canada, and some from South America and Australia, but report trade flat in Europe, South Africa and the Orient. The foreign business is not expected to show much improvement until the conditions change in Germany and other Continental countries. As long as domestic business continues as active as it now is the slackness of foreign demand will not be felt by the company.

Charles H. Besly & Co., Chicago, are just moving into an addition to their shop at Beloit, Wis., which will nearly double the capacity of the works. They do not observe any indication of the slackening of business in any direction. The month of December was one of the best in all their experience. Among the sales in that month was a full carload of Gardner grinders. The demand for a special tool of this character may be taken as a good indication of the heavy trade now in progress. The firm have also found the demand for general mill supplies and machinists' tools exceedingly active, and giving promise to so continue. The outlook is considered exceedingly favorable for a large business the coming year.

Manning, Maxwell & Moore, Chicago, report a large demand for both iron and wood working tools. This demand covers the entire line, from foot power machines up to the largest tools made. The business of all their customers is steadily growing, the little factories becoming bigger and the large establishments making additions.

The John H. Dawson Machinery Company, Chicago, are enjoying a very heavy trade. The largest sale recently made was quite a quantity of tools to the Olds Motor Works, Lansing, Mich., who are just fitting up factories at that place. They have also sold outfits of tools to two new ball bearing axle factories. They have had considerable business recently with Canada, and have made some good purchases of American tools now being shipped back to this country from exhibitions in Europe. They note as an interesting occurrence in their experience the receipt of orders from New England. They have had some trouble recently in securing satisfactory shipments from factories of medium sized tools. The factories represented by them are so crowded with work that buyers are compelled to wait longer than had been anticipated.

The Marshall & Huschart Machinery Company, Chicago, report December to have been the largest month in their experience. The inquiries are keeping up so well that they expect future business to be equally as good if not heavier. Most of the factories they represent are now shipping tools in good season, but a few, particularly those making exceptionally popular tools, are from three to six months behind in making deliveries.

McDowell, Stocker & Co., Chicago, had the best December in their experience, but the total volume of business fell somewhat below that of November, which had been the largest month in their history. In their experience recently they have found that most orders for tools of any size have been split up among different houses. The question of delivery, preference for some particular make or possibly some slight inducement as to price is the cause of the division of orders. The firm are quite confident that the future will develop an active condition of trade, and expect to see the coming year equal if not surpass 1901.

The Chicago Pneumatic Tool Company enjoyed an unusually large business in December in view of the fact that railroad companies usually wait until after the first of the year to place new orders. December proved to be one of the largest months of the entire year. They have recently had a large increase in their foreign trade. The outlook for the coming year is not only very encouraging for domestic business, but also for their foreign trade, especially the latter, as a number of the largest engineering shops abroad are contemplating the installation of pneumatic plants.

The National Meter Company, through their branch office in Chicago, are finding a steadily increasing Western demand for their Nash gas engines. When this branch was first opened a few years since the demand for gas engines ranged from 2 to 30 horse-power. Last year the range was from 15 to 100 horse-power, with a constant tendency to the larger sizes. This is taken to indicate the increasing confidence of large power users in the efficiency of gas engines for general purposes. The Chicago branch expects to double the business of last year in gas engines. The company will enlarge their works the coming spring, and will double their capacity, to provide for the expansion of both Eastern and Western business.

## The Pittsburgh Foundrymen's Association.

The regular monthly meeting of the Pittsburgh Foundrymen's Association was held in Pittsburgh on Monday evening, January 6. Those present were John McLaren and W. J. Phillips of Phillips & McLaren; Samuel D. Sleeth, Westinghouse Air Brake Company; T. E. Malone, J. S. McCormick Company; William Yagle, William Yagle & Co., Limited; J. S. McDonald, British Westinghouse Electric & Mfg. Company; David Evans, Pennsylvania Casting Machine Company; John A. Penton, Detroit, Mich.; S. H. Stupakoff, Vulcan Mfg. Company; Samuel T. Johnston, S. Obermayer Company; A. O. Backert, the *Iron Trade Review;* F. S. Jackman, Pittsburgh Mfg. Company; F. H. Zimmers, Union Foundry & Machine Company; A. W. Slocum, Keystone Car Wheel Company, and Robert A. Walker of *The Iron Age.* John McLaren presided and F. H. Zimmers was secretary. S. H. Stupakoff read an interesting paper on "Molding Machines" and a short discussion of the paper followed. The secretary read a letter from Fred. F. Stockwell of the New England Foundrymen's Association, stating that at their meeting to be held this week a new Executive Committee would be appointed, which would have in charge the matter of arranging entertainment for the delegates to the annual meeting of the American Foundrymen's Association, to be held in Boston in the latter part of June. It is probable a large delegation of Pittsburgh foundrymen will be present at this meeting.

Ornamental workers of Pittsburgh have presented a wage scale to employers to become effective February 1, proposing advances for both fitters and helpers. The advance for fitters is to 45 cents an hour, the present rate being 33 1-3 cents. Helpers get 25 cents an hour and the scale proposes 32½ cents. It is said the advances will only put the workers on a better relative wage relation to their allied craft, the structural iron workers.

## A Central Mining Institute.

A novel and very interesting undertaking has been initiated at Frankfort-on-the-Main under the title Central Mining Institute (Zentrale fuer Bergwesen, G. m. b. H.), the following firms uniting to form the association:

Allgemeine Deutsche Creditanstalt, Leipsic.
Allgemeine Elektrizitaetsgesellschaft, Berlin.
Bergisch-Maerkische Bank, Elberfeld.
Berliner Handelsgesellschaft, Berlin.
Gebrueder Bethmann, Frankfort-on-Main.
Deutsche Gold und Silber Scheide Anstalt, formerly Roessler, Frankfort-on-Main.
Direction der Disconto-Gesellschaft, Berlin.
Duisburger Kupferhuette, Duisburg.
Elektrizitaets-Actiengesellschaft, formerly Schuckert & Co., Nuernberg.
Von Erlanger & Soehne, Frankfort-on-Main.
Ertel, Bieber & Co., Hamburg.
Farbwerke, formerly Meister, Lucius Bruening, Hoechst-on-Main.
Frankfurter Filiale der Bank fuer Handel und Industrie, Frankfort-on-Main.
Von Erlange & Soehne, Frankfort-on-Main.
Metallurgische Gesellschaft, A. G., Frankfort-on-Main.
A. Schaaffenscher Bankverein, Berlin and Cologne.
Lazard Speyer-Ellissen, Frankfort-on-Main.
Jacob S. H. Stern, Frankfort-on-Main.

The Metallurgische Gesellschaft has abolished its department of mining and geology in favor of the institute, to which the complete records and library of that department have been transferred.

The considerations which have led to the formation of the institute are explained as follows:

No one probably will dispute the extraordinary degree of economic importance attained by the mining industry within the last few decades. And yet, although the amount of capital invested in mines goes on increasing from year to year and in spite of the fact that the risks connected with mining are greater than those of almost any other industry, it is in this branch of the industry that a systematic working out of technical and economic principles has been most neglected. Therein also lie the greatest difficulties as to the most suitable and profitable method of procedure.

When the readiness is considered with which the investing public generally enters into mining speculations, it is not to be wondered at that year after year so many ventures are floated which from the very start have not the slightest prospect of success; nor that so many undertakings, promising enough in themselves, do not produce the results anticipated. Even those whose special concern it is to make careful and detailed examinations of matters of this kind are often liable to considerable uncertainty as to the best methods of dealing with mining schemes.

This partly is the result of the advanced stage of development in the various branches of the mining industry and the allied sciences (mining engineering, geology, ore dressing, metallurgy, mining law, &c.), as well as in mining machinery and ore deposits, which makes it impossible for any one man to have command of the whole subject, so that specialization is an absolute necessity; and all the more so since the nature of the various mining products (coal, rock salt, potassium salts, gold, iron and other ores) require different methods of treatment, both in the process of extraction and in the subsequent processes.

It must be further taken into consideration that a purely theoretical knowledge of these subjects may easily prove a source of considerable danger, unless supported by extensive practical experience.

Generally speaking, a selection of the most suitable man for an expert opinion on any particular venture is attended with the greatest difficulty, and particularly for those who are inexperienced in mining affairs. The choice, under existing circumstances, is more or less a matter of chance. Even if application is made to men occupying prominent positions in the mining world, they often do not take the time to consider the peculiar nature of each case, and are themselves not always in a position to judge if the party recommended is sufficiently familiar with the country in which the mines to be examined are situated. Besides, in many cases the recommendation is prompted by friendship.

The principles to be observed in preparing reports and opinions are equally ill defined. Often enough points of geological or technical importance are overlooked, while undue importance is attached to matters of minor consequence. The weakest point, however, in the majority of reports, lies in the not over careful examination of the economic conditions of a mining venture. The information concerning the value of the mineral products, the cost of extraction and transportation and the condition of the markets, is often incomplete and inaccurate, and the calculation of prospective profits is only too often most faulty. Such questions as the possibility of establishing means of communication, of applying the proper methods of dressing and reduction, are in many cases not duly considered until large sums of money have been spent—often without recovery—on works of exploration and development, as well as on the erection of an expensive plant.

In many instances a competent preliminary examination of the data furnished by the promoters of a mining venture is sufficient to prove that there is no prospect of success; in others, such a report of an examination would give many valuable hints for the selection of suitable experts and the best methods to be followed for a more complete investigation.

Finally, investors in mining projects generally encounter a great deal of difficulty in finding suitable men to direct and supervise their undertakings, and the same is the case when endeavoring to obtain reliable technical advice and assistance.

The institute will be ready for work on January 1, 1902. The business management has been intrusted to Mr. Eichmeyer, formerly Chief Inspector of Mines at Clausthal, and to Doctor Naumann, hitherto manager of the Mining and Geological Department of the Metallurgische Gesellschaft. The services of Professor Lengemann, Geheimer Bergrat, Aix La Chapelle, have been secured as technical and scientific adviser. The Royal Geological Landes Anstalt of Prussia has taken an interest in the endeavors of the institute and has declared its readiness to promote the advantages of same by giving advice whenever desired. Professor Dr. Beyschlag, Geheimer Bergrat, Berlin, has promised the institute the benefit of his advice and assistance.

## Another Edgar Thomson Furnace Record.

In December, 1901, Furnace E of the Edgar Thomson group, at Bessemer, made 19,554 gross tons of Bessemer iron. This is an average daily output of a little more than 630 tons. The coke consumption was about 1800 pounds per ton of iron made. Furnace E is 90 feet 9 inches high. 22 feet in diameter at the bosh and the well is 14 feet. When the size of the furnace is considered, this is a remarkable record for output, and reflects considerable credit on the management of the furnace. It is a fact that many of the big furnaces 100 feet high and over are averaging very little over 500 tons of iron a day. Furnace E was blown in on December 5, 1900, and has been making excellent records right along, but the output for last month beats anything heretofore done in any one month.

Furnace H of the Edgar Thomson group made up to December 1, 1901, 1,088,869 tons of iron on one lining. The furnace was blown in on March 13, 1894, and has been in continuous operation ever since, except for a short period, when it was banked on account of a coke strike. The furnace is still in good shape, and will likely continue in blast for a long time to come. This record is without parallel in blast furnace practice, either in this country or on the Continent.

**The Detroit Bridge Plant Sold.**—The American Bridge Company have purchased the properties heretofore owned by the Detroit Bridge & Iron Company of Detroit, Mich., and the same will hereafter be known as the Detroit plant of the American Bridge Company. Max J. L. Fowler has been appointed manager. The plant thus becomes a part of the Western division of the American Bridge Company, under the jurisdiction of August Ziesing, Western manager, in Chicago.

## Iron and Industrial Stocks.

Under the leadership of the United States Steel issues the market for steel stocks advanced quite steadily during the greater part of the week under review. The climax was reached during the early part of Tuesday, when reports that the statement of the Steel Corporation would prove disappointing caused a decline. The sales of United States common were 123,000 shares on Friday, 106,000 on Monday and 118,000 on Tuesday, while the preferred sold on the same days to the extent of 82,000, 114,000 and 93,000 shares respectively. The price reached 46¾ for the common and 97¾ for the preferred on Tuesday morning, but declined sharply and opened to-day at 44¼ for the common and 95 for the preferred. Tuesday witnessed some heavy transactions in Cambria Steel stock, 12,000 shares selling at 25½ to 26.

**United States Steel Corporation.**—The following is the official statement of earnings for all the companies of the steel corporation for the first nine months of their existence:

| | | |
|---|---|---|
| April | | $7,356,744 |
| May | | 9,612,349 |
| June | | 9,394,747 |
| July | | 9,580,151 |
| August | | 9,810,880 |
| September | | 9,272,812 |
| October | | 12,205,774 |
| November | | 9,795,841 |
| December (estimated) | | 7,750,000 |
| | | $84,778,298 |
| Less amounts set aside for the following purposes—viz.: | | |
| Sinking funds on U. S. Steel Corporation bonds and bonds of subsidiary companies | $2,263,292 | |
| Depreciation, reserve and contingent funds and improvements | 9,695,702 | |
| | | 11,958,994 |
| Balance | | $72,820,304 |
| Nine months' interest on bonds | | 11,400,000 |
| Balance | | $61,420,304 |
| Nine months' dividends on stocks—viz.: | | |
| United States Steel Corporation, Preferred, 5¼ per cent. (7 per cent. annually) | $26,752,894 | |
| Common, 3 per cent. (4 per cent. annually) | 15,227,812 | |
| | $41,980,706 | |
| Outstanding stocks of subsidiary companies | 25,101 | |
| | | 42,005,807 |
| Balance applicable to surplus or new construction | | $19,414,497 |

The report was signed "E. Shearson, Controller." It was noted on the report, with reference to the decreased December earnings, that "during the close of lake navigation, from December to April, inclusive, the earnings of mining and transportation companies are, of course, diminished."

The Columbus & Hocking Coal & Iron Company report net profits of $46,620 for the quarter ending November 20.

The Sloss-Sheffield Steel & Iron Company report for November: Profit from operation, $98,674; deductions for depreciation, charges to extraordinary repair and renewal fund and proportion of insurance, $13,181; net earnings, $85,493; monthly proportion of interest and taxes, $19,156; net surplus, $66,337.

The net earnings of the American Car & Foundry Company are reported to have been as follows:

| | 1901. | 1900. | |
|---|---|---|---|
| Three months ending November 30 | $938,611 | $544,484 | +$394,127 |
| Four months ending August 31 | 1,086,864 | 2,002,742 | —915,878 |
| Total, seven months | $2,025,475 | $2,547,226 | —$521,751 |

**Dividends.**—The Standard Plate Glass Company of Pittsburgh have declared the usual semiannual dividend of 3 per cent.

The Allegheny Heating Company of Pittsburgh have declared a quarterly dividend of 3 per cent., and an extra dividend of 5 per cent., payable January 25.

The Pittsburgh Coal Company have declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable January 25.

The Monongahela River Coal & Coke Company of Pittsburgh declared the regular semiannual dividend of 3½ per cent., payable January 15.

The Washington Charcoal Iron Tin Mills of Washington, Pa., have declared a quarterly dividend of 3 per cent., payable January 10.

The Tennessee Coal, Iron & Railroad Company have declared the usual quarterly dividend of 2 per cent. on their preferred stock, payable February 1. Books close January 16 and reopen February 3.

The American Car & Foundry Company have declared the regular dividend of 1¾ per cent. on the preferred stock, and one-half of 1 per cent. on the common stock, payable February 1. Books close January 10 and reopen February 3.

The Wheeling Natural Gas Company of Wheeling and the Ohio Valley Gas Company of East Liverpool, Ohio, have each declared quarterly dividends of 2½ per cent., payable January 18.

The Standard Underground Cable Company, at Pittsburgh, have declared, besides the usual quarterly dividend of 2 per cent., an extra dividend of 2 per cent. out of the earnings of the year. Both dividends are payable January 10.

The directors of the United States Steel Corporation have declared a dividend of 1¾ per cent. on the preferred stock, and 1 per cent. on the common stock. The preferred dividend is payable February 13, books closing January 25. The common dividend is payable on March 21, books closing on February 27.

**The Pittsburgh Coal Company.**—At a meeting of the stockholders of the Pittsburgh Coal Company, held in Pittsburgh on Tuesday, January 7, F. L. Robbins, chairman of the Board of Directors and of the Executive Committee, was elected president, the three offices being consolidated. John D. Nicholson, vice-president, was elected treasurer, the two offices being combined. Henry C. Frick was elected director to fill a vacancy; J. B. L. Hornberger was elected auditor, a promotion from his former position as assistant auditor. F. J. Lemire was elected secretary. The regular quarterly dividend of 1¾ per cent. on the preferred stock was declared. A lease of the property of the Shaw Coal Company, covering a period of 40 years, was approved. The Pittsburgh Coal Company have acquired or hold under option coal properties in the Hocking Valley district in Ohio worth nearly $10,000,000. The Columbus & Hocking Coal & Iron Company, capitalized at $7,000,000, are not included.

**The Westinghouse Machine Company.**—The stockholders of the Westinghouse Machine Company of Pittsburgh have unanimously voted to increase the capital stock from $2,500,000 to $5,000,000, a good portion of which increase will be utilized for additional working capital to meet the growing demands upon the company. George Westinghouse, who owns all the preferred stock, amounting to $1,500,000, has relinquished his right as a preferred stockholder, and hereafter all stock will be of one class. The net earnings of the company for the past two years have been at the rate of 20 per cent. a year.

**The Sharon Steel Hoop Company.**—The Sharon Steel Hoop Company, Sharon, Pa., manufacturers of hoops, bands and cotton ties, will make some large additions to their plants. These will include a new blooming mill, several finishing mills and a basic open hearth steel plant to make their own steel, as the company desire to be independent of the open market. It is intended to more than double the capacity of the plant, and plans are now being drawn for these additions.

**A Mills Hotel for Pittsburgh.**—Henry Phipps, the well-known steel manufacturer of Pittsburgh, is in that city this week, and report has it that Mr. Phipps will build a large hotel in Pittsburgh, modeled after the famous Mills hotels in lower New York. Mr. Phipps has declined to divulge his plans regarding his new enterprise, but it is said work on the new structure will be started as soon as the site is secured and plans can be made. The building will be of steel frame construction and practically fire proof.

## Lackawanna Iron & Steel Company.

On the shore of Lake Erie, just south of the city of Buffalo, on a tract of land having a lake frontage of 3½ miles, the great steel plant of the Lackawanna Iron & Steel Company now presents an imposing array of structures and a scene of great activity.

When the Lackawanna Company decided to remove from Scranton, Pa., to Buffalo, in order to secure a site offering the greatest advantages for collecting raw materials and distributing product, it was proposed to confine the product as in the past to steel rails and billets. It soon became evident that the new plant offered exceptional advantages to the producers of all finished material. The plans have therefore grown to double the original proportions, and contemplate an estimated production of 1,250,000 tons of steel per annum. The general plan has been developed in all directions, until it is now well balanced and well rounded, its elements being:

1. The exceptionally fine site on the lake, with a harbor already secured by the new Government breakwater—giving access to the extensive ore docks and shipping wharves—challenges comparison.

2. An up to date plant, in which efforts are directed to advancing quite beyond what has heretofore been considered "the best practice," with, surely, the minimum cost of gathering and handling the raw materials.

3. A large area of fine coking coal, from which excellent results are obtained by the Otto-Hoffman process. The coal will be coked alongside the furnaces (all waste gases being utilized as power) at figures which compare favorably with those paid by Pittsburgh furnacemen.

4. The supply of iron ore, too, seems to have been thoroughly covered. The company hold, together with the Pennsylvania Steel Company, a controlling interest in the great Cornwall ore bank. Upward of 200,000 tons high grade Bessemer pig iron per annum will be produced by their own furnaces in Lebanon County, Pa., and those under lease to them on long term contracts. This is in addition to what may be smelted in the Buffalo furnaces. They also own controlling interests in some fine properties on the Mesaba and the older ranges (both Bessemer and non-Bessemer), together with long term contracts for Old Range Bessemer ore from properties not controlled. These would apparently cover all probable requirements for many years, but, in addition, the interest of the Shermans in the Wirtherbee, Sherman & Co. properties on Lake Champlain have just been purchased, and thereby a large supply of cheap ore secured for the future which will be of especial value in connection with the Talbot open hearth process, which the company control.

5. A very wise provision has been made by the company in building, under separate charter, a terminal road, the South Buffalo Railroad Company, by means of which connection will be secured with every railroad system entering Buffalo. This also enables the company to offer special inducements to kindred plants desirous of locating near the new steel works.

6. Last, but of prime importance to the stockholders, comes the question of capitalization. This is extremely conservative. Only one class of stock has been issued—subscribed at par—to pay for property at actual cost and provide proper working capital, &c. No bonds have been issued by the company and none are contemplated. In time of stress the company will be in a very strong position with no fixed charges to meet.

**Proposed Crucible Steel Plants of the Norwalk Iron & Steel Company.**—We are officially advised that the Norwalk Iron & Steel Company, recently incorporated with a capital stock of $1,000,000, have secured 1400 acres of land, laying between Norwalk, Ohio, and the Huron River, where they will break ground for the erection of their plant as soon as the plans are completed, which will be within the next few weeks. Work of construction will be pushed as rapidly as possible, and they expect to be making tool steel in May or June. The main building will be 100 x 460 feet, with boilers and gas producers alongside, and will be equipped with two 30-ton crucible steel furnaces, large and small hammers and mills to roll sheets and bars. Other plants will be erected in the near future, according to present plans.

**The National Bridge Company.**—The National Bridge Company have applied for a charter under the laws of New Jersey and have opened offices in the Fitzimmons Building, Pittsburgh. These are in charge of E. M. Scofield, formerly manager of the Youngstown works of the American Bridge Company. Identified with Mr. Scofield in this new enterprise is William Conger, formerly of the American Bridge Company. The National Bridge Company have secured a site of 47 acres at Monaca, on the Pittsburgh & Lake Erie Railroad, about 20 miles from Pittsburgh. The land adjoins the property on which the Colonial Steel Company of Pittsburgh are now building a crucible steel plant. It is the intention to build a modern bridge works on the property, and bids are being asked for putting the ground in shape and for the buildings and equipment. It is understood that some capitalists are associated in this new enterprise and that work on the new plant will be pushed as fast as possible. The buildings will be steel frame construction and the equipment will be modern throughout.

Trenor L. Park of Catlin & Co. announces that he and his friends who held the control of the old American Trading Company now hold a controlling interest in Flint, Eddy & American Trading Company. This latter company were formed a year and a half ago to take over the business theretofore done by the American Trading Company, who are engaged in the commission business with China, Japan and the East, together with the business of Flint, Eddy & Co., who were engaged in a similar business in South and Central American countries, the West Indies, Australia, the Cape and elsewhere. At the time of the formation of the new company and the consolidation of the two businesses the owners of the American Trading Company took a minority interest, but recently they have purchased the balance of the new company's treasury stock and have also bought from the members of the old Flint, Eddy & Co. a block of their holdings in the present company, so that they now have a large controlling interest in the new company.

At a meeting of the principal producers of brass, held in New York last Thursday, the prices of brass were reduced from 5 to 7½ per cent. The discount on sheet brass was increased from 30 to 35 per cent. On brass rods and wire the 30 per cent. discount was changed to 37½ per cent. The brass tubing discount was changed from 40 to 45 per cent. Although these changes in discounts are not proportionate to the decline in copper, the manufacturers claim that the new prices are fairer, in comparison to the price of copper, than the old figures were. For a long time the brass makers were operating with scarcely any profit, owing to the low price of brass.

Charles Schoen, formerly of the Pressed Steel Car Company, but who severed his connection with that concern some time since, is actively engaged in getting plans ready for the building of a large car wheel plant in the Pittsburgh district, the wheels to be made under a new process which Mr. Schoen controls. Some of the equipment for the new works has already been placed, a large part of it being given to the Bethlehem Steel Company, Bethlehem, Pa.

The stockholders of the Lloyd Mfg. Company of Pittsburgh have increased their capital stock to $75,000, and have elected Chas. H. Lloyd president, and John C. Donehoo secretary and treasurer. The concern will make coal digging machines.

Joseph Parkin Hunter of the firm of Gwynn & Hunter, machinists' supplies of Baltimore, Md., died on December 19, at Denver, Col., aged 41 years.

The Cadwalader Tin Plate & Metal Company of Pittsburgh will apply for a charter on January 28.

# HARDWARE.

THE curiosity of the trade in regard to the projected great consolidation of jobbing interests is kept alive by items which from time to time appear in the daily press and reports of the coming and going of those who are understood to be interested in the movement. Nothing definite can, however, be learned in regard to the progress which is being made or whether the matter is abandoned for the time being. It is understood that options given were to expire on the first of the present month, but it is assumed that most of them could be renewed without difficulty, as they were probably on terms so advantageous to those giving them that they would be quite safe in extending them. The scheme of jobbing consolidation on a gigantic scale furnishes so attractive a field for theorizing that it would be almost a pity if it should be found impracticable to materialize the fantastic castles in the air. Very few practical men in the trade outside of those who are directly interested in the effort find anything feasible in it. Some even are frank enough to make the point that the jobbing trade, while occupying a mostly useful place, are not absolutely essential, and that many retailers might be audacious enough to go directly to the manufacturers even in the presence of a great consolidation of jobbing houses. Then, too, it is quite safe to assume that there will be a host of smaller jobbers ready to supply them.

We give elsewhere an enumeration of the retail Hardware associations now in operation. Those who have not followed the movement will be surprised at their number and the wide extent of territory which they cover. In most cases, too, it will be seen that those identified with them are thoroughly representative merchants who occupy an influential position in the trade. During the next month or two most of the associations will hold their annual meetings, which will be looked forward to with interest by those who desire to understand the part which these organizations are to play in the determining of trade questions. If they can succeed in advancing the interests of the retail merchants to any such extent as associations of the wholesale trade have advanced jobbing interests, they will be a most important factor, and one which cannot be ignored by either manufacturers or jobbers.

The carrying on of these associations is necessarily attended by more or less expense, according to the methods which are adopted, and the question as to how this expense is to be met is one which presents itself for decision. The annual payments of the membership are, in most cases, probably ample. Where the organization is at all successfully established a sufficient income should thus be derived. Whatever methods are resorted to, it is important that the association should rely upon itself and not call upon either jobbers or manufacturers to come to its assistance.

A commendable example of this spirit was given during the past year, when a suggestion from an outside source that manufacturers and jobbers should contribute to the maintenance of the National Retail Hardware Dealers' Association was negatived by those identified with the movement. It was recognized that accepting contributions from manufacturers or jobbers who might be interested in decisions relating to some of the pending trade questions might embarrass the association. In the decision of such questions personal and private interests should obviously be ignored. It is important that this principle should be borne in mind in connection with solicitations for advertisements from jobbers or manufacturers for the handbooks or manuals which some of the associations will probably be getting out. With the desire of manufacturers to stand well with the retail trade it would probably be an easy matter to obtain many advertisements for such publications on the assumption that the appearance of the advertisements would commend the houses to the favor of the trade. Especial care should be taken that no pressure of this kind is brought to bear on either jobbers or manufacturers. If any of these desire to avail themselves of the advantage of such an advertising medium it would, of course, be proper to accept the advertisement, but soliciting the advertisement on the ground that it would evidence sympathy with the association or help it to carry on its work should be carefully avoided. It is obviously impracticable for manufacturers to aid in this way the constantly increasing number of associations, and they should not be expected to do it. It is to be hoped for the credit of the movement that retail Hardware associations will take an independent and dignified position in this matter.

## Condition of Trade.

Notwithstanding the short time which has elapsed since the opening of the year there is already a quickening in the demand, and merchants are evidently getting ready without delay for the business which will soon be upon them. The number of travelers who have entered upon their routes is increasing from day to day, and very satisfactory reports are beginning to come in from those who were earliest in the field. It is assumed that most houses are finding that last year was a profitable one and that its results will enable them to prosecute business with renewed vigor and enterprise. There is a disposition to order goods in advance of actual need, as in many lines there has been delay in shipment on account of manufacturers being unable to turn them out in sufficient volume to meet their customers' requirements. The difficulty which manufacturers have had in procuring raw material is one of the causes of this condition, and even at the present time after the holiday lull in the demand there is still much complaint by them on this score. This naturally influences goods in the matter of price, especially those lines in which the large proportion of the cost is iron or steel, and the market is rendered decidedly strong. There is some reason to anticipate further advances in some of these lines, notwithstanding the fact that most representative manufacturers regard with disapproval any movement toward higher prices, knowing that it will be followed sooner or later by an inevitable reaction. Hardware generally is held at satisfactory prices, feeling the effect of the existing state of things in the iron market and the large volume of business which has been doing and is expected during the season. The labor cost of goods is unobtrusively but steadily increasing, inasmuch as while there are but few open advances, practically every Hardware manufacturer finds it necessary to increase wages in individual cases or in certain departments from time to time. Some kinds of heavy goods which have been exceptionally scarce are in better supply, and it is possible where these have been held at high prices owing to the practical control of the market pending the development of outside competition, that with the entrance into the field of competing products a revision of prices may result. Some lines which have been more or less weak on account of reaction from such high prices are apparently finding their level and a more confident tone

is prevailing with more regular prices. If the volume of business is at all up to expectations there will be undoubtedly a scarcity in several branches of the trade.

### Chicago.

*(By Telegraph.)*

The Hardware trade is fulfilling the expectation of good business for the new year. The claim is made that there never was such a volume of business during inventory season as at present. Orders have been coming in freely from dealers throughout the Northwest, whether salesmen were on the road or not. Retail merchants are evidently finding their customers in such need of the general line of goods that they are compelled to send in pickup orders to keep their stocks replenished. A feature of current trade is the heavy demand for spring goods. Dealers are taking time by the forelock for a supply of goods which have been particularly scarce in past seasons. They are quite largely ordering them to be shipped at an early day, instead of booking for future delivery. They will thus have the merchandise in stock instead of endeavoring to satisfy their customers with promises, as in previous seasons. The movement of Nails and Fencing Wire is especially large. Jobbers of Heavy Hardware likewise report a vigorous opening of the new year. The demand for their goods is of a general character, but a particularly strong movement is noted in Wagon Material. Prices show an upward tendency in a number of lines. Horseshoes have been advanced 10 cents, and manufacturers advise the trade that prices are subject to further change without notice. Plow Shares and kindred goods have been marked up 5 to 7½ per cent. Hammers, Picks and other handled goods have been advanced about 10 per cent. Turn Buckles are also higher. Much difficulty is experienced in getting shipments of Bolts, Washers and other small wares from the factories.

### St. Louis.

*(By Telegraph.)*

The Hardware trade are certainly justified in looking back and pointing to the year of 1901 as being a remarkable one in the history of the trade. It is true that many adverse and serious conditions came up to check affairs at times, for instance, the great drought in some sections, the Steel strike and unsettled conditions of prices in some lines, but notwithstanding this from all quarters we are able to report unprecedented demand, and the constant breaking of records of jobbers' sales. Animation and a confident feeling marked the close of the year; and it would appear that 1902 opens with a remarkably clear sky, and prospects for a large and increasing business. As attesting in a positive way the general business prosperity prevailing at this time, the clearings of the associated financial institutions of St. Louis for the first two days of the new year were record breakers and were never before equaled in the history of the Clearing House.

## NOTES ON PRICES.

**Wire Nails.**—The demand for Wire Nails shows an improvement, and contracts are being placed quite liberally for the spring trade. It is understood that there have been some conferences between the leading interest and some of their principal competitors with a view to some kind of an agreement as to prices. It is not supposed that the effort aims at any comprehensive plan for concerted action, but rather to reach some kind of an understanding to keep prices from becoming demoralized. There is reason to think that some results are being accomplished in this direction, as some of the extreme prices recently announced by leading outside manufacturers have been withdrawn. Indications thus point to a somewhat firmer market, which is represented by the quotations of $2 to $2.05, f.o.b. Pittsburgh.

*New York.*—The local Wire Nail market reflects the usual quiet condition of trade immediately after the first of the year. The market is represented by the following quotations: Small lots from store, $2.25 to $2.30; carloads on dock, $2.25.

*Chicago, by Telegraph.*—The American Steel & Wire Company report their business in Wire Nails beyond all precedent. The month of December with them was the month of largest tonnage in their history. Present indications point to a demand this month which will be fully up to their capacity. Heavy contracts have been placed by large buyers to cover their wants for the approaching spring trade. The volume of business is so large that the independent Nail manufacturers are now endeavoring to secure a concerted advance in prices which will bring them up to a point affording a reasonable profit on the advanced cost of material. Jobbers report an unusually heavy trade, which has possibly been stimulated by the reduction made the past week by one of the local jobbers and which was met by the others. Small lots are quoted at $2.15 to $2.25 and carloads at $2.10.

*St. Louis, by Telegraph.*—A lighter demand is reported in the market for Wire Nails and prices hold steady around the present level. Nails from store are quoted at $2.25.

*Pittsburgh.*—A slightly better demand for Wire Nails is reported and the tone of the market is perhaps a little stronger. An effort is being made by some of the mills to come to some agreement to control prices of Wire Nails, but as yet nothing definite has been done. However, a meeting of Wire Nail makers is to be held in Pittsburgh on January 15. We quote Wire Nails at $2 in carloads and $2.10 to $2.15 in small lots from store.

**Cut Nails.**—The Cut Nail market is without noticeable change. Demand is fairly satisfactory, considering the season. General quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

| | |
|---|---|
| Carload lots | $2.05 |
| Less than carload lots | 2.10 |

*New York.*—There is but a moderate demand for Cut Nails in the local market. Representatives of mills are adhering to the price of $2.25 for Nails from store. Jobbers are asking the same price generally, but in some instances are selling 2 cents below these figures. New York quotations for carload and less than carload lots are as follows:

| | |
|---|---|
| Carload lots on dock | $2.18 |
| Less than carload lots on dock | 2.23 |
| From store | 2.25 |

*Chicago, by Telegraph.*—Very small quantities of Cut Nails are now being sold, as the disparity between Cut Nails and Wire Nails is too great. Small lots are quoted at $2.30.

*St. Louis, by Telegraph.*—A limited business is being done in the market for Cut Nails, due largely to the price at which Wire Nails can be purchased at this time. Small lots from store are quoted from $2.30 to $2.35.

*Pittsburgh.*—The Cut Nail market is firm and certain sizes are difficult to obtain, owing to the fact that steel is scarce and mills making Cut Nails are restricted in output on this account. We quote Cut Nails at $2.05 in carload lots and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination.

**Barb Wire.**—Orders for Barb Wire for spring delivery are being placed quite freely, as indications point to a large demand. The market shows more firmness and prices are less irregular. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

| | |
|---|---|
| To jobbers in carload lots, Painted | $2.60 |
| To jobbers in carload lots, Galvanized | 2.90 |
| To jobbers in less than carload lots, Painted | 2.65 |
| To jobbers in less than carload lots, Galvanized | 2.95 |
| To retailers in carload lots, Painted | 2.70 |
| To retailers in carload lots, Galvanized | 3.00 |
| To retailers in less than carload lots, Painted | 2.80 |
| To retailers in less than carload lots, Galvanized | 3.10 |

*Chicago, by Telegraph.*—From present appearances the trade in Barb Wire is likely to exceed that of the opening months of last year. Dealers are purchasing heavily from jobbers and jobbers are placing unusually large

orders with manufacturers. The consequence is that manufacturers are arranging for a much larger output than last year, believing that it will be easily absorbed by the trade. Jobbers quote small lots at $2.70 to $2.80 for Painted and $3 to $3.10 for Galvanized, with 5 cents off for carloads.

*St. Louis, by Telegraph.*—A fair business is being booked in the market for Barb Wire and a very promising spring trade is being looked forward to. Prices are without change. Jobbers quote carload lots at $2.80 for Painted and $3.10 for Galvanized.

*Pittsburgh.*—Tonnage is improving and the outlook for spring trade is good. The tone of the market is firm and there is less irregularity in prices than for some time. For ordinary orders prices are as follows: Galvanized Barb Wire, $2.90 in carload lots to jobbers, and Painted, $2.60. Terms 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

**Plain Wire.**—Large contract orders for Plain Wire are being placed by consumers. The outlook for spring trade is excellent. For large and desirable orders some shading of prices is reported. Regular quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

| Base sizes. | Plain. | Galv. |
|---|---|---|
| To jobbers in carload lots | $2.25 | $2.65 |
| To jobbers in less than carload lots | 2.30 | 2.70 |
| To retailers in carload lots | 2.35 | 2.75 |
| To retailers in less than carload lots | 2.45 | 2.85 |

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 to 9 | Base | | | | $0.40 | extra. |
| 10 | $0.05 | advance | over | base | .40 | " |
| 11 | .10 | " | " | " | .40 | " |
| 12 and 12½ | .15 | " | " | " | .40 | " |
| 13 | .25 | " | " | " | .40 | " |
| 14 | .35 | " | " | " | .40 | " |
| 15 | .45 | " | " | " | .75 | " |
| 16 | .55 | " | " | " | .75 | " |
| 17 | .70 | " | " | " | 1.00 | " |
| 18 | .85 | " | " | " | 1.00 | " |

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

*Chicago, by Telegraph.*—A good trade in Plain Wire is enjoyed by both manufacturers and jobbers. A special feature of this business is the continued placing of contracts by manufacturing consumers. Jobbers quote small lots at $2.15 to $2.25.

*St. Louis, by Telegraph.*—A lighter demand is to be noted for Plain Wire, but still requirements are said to be of fair proportions. A slightly lower range of quotations is reported. Jobbers quote No. 9 at $2.35 and Galvanized at $2.75, with the usual advance for other sizes.

*Pittsburgh.*—Current demand is heavy, and the output of the mills is contracted for about as fast as made. Fence makers and other consumers are placing liberal orders. For the usual run of orders prices are as follows:

| | |
|---|---|
| To jobbers in carload lots | $2.25 |
| To jobbers in less than carload lots | 2.30 |
| To retailers in carload lots | 2.35 |
| To retailers in less than carload lots | 2.45 |

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, $1 advance. Terms are 60 days, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh. On large orders these prices are shaded to some extent.

**Horseshoes.**—Under date January 3, at a meeting of the associated manufacturers of Horseshoes, the price of all Shoes was advanced 10 cents per keg. This makes the base price for Iron Horseshoes $3.60 per keg, and for Steel, $3.35 per keg. To these prices freight from Pittsburgh to destination is to be added. The manufacturers, in making this advance, refer to the increased cost of coal, iron and steel during the past six months as justifying an advance of about 20 cents, but it was thought advisable to be governed by a conservative policy and make only the advance referred to.

**Heavy Hammers, &c.**—The advance made last month is being firmly maintained and the market has a steady and strong tone. A good deal of difficulty is experienced by the mills in obtaining supplies of steel with sufficient promptness.

**Tinware.**—The trade are watching the Tinware market in anticipation of advanced prices, as the result of the conferences, which, it is understood, have been taking place between the manufacturers. Practically all articles in the line of Sheet Metal Household Goods are held very firmly, and it is anticipated that higher prices may be announced in the near future. Trade is still feeling the effect of the strike of last summer and stocks are bare, and with the existing demand and the promise of its continuance, are not likely to be full during the next few months at least. There is much delay in executing orders for steel and the car famine is increasing the difficulty of the situation.

**Hollow Ware.**—Prices in the Hollow Ware market are steadily maintained, but on a level which is referred to by the manufacturers as uncomfortably low, notwithstanding the advances which took place during the last year.

**Chain.**—The Chain market is very firm, and it is thought by some that advances may be necessitated in the near future if the present condition of the market in raw material continues. The manufacturers have been pursuing a conservative policy and have carefully refrained from putting up prices too rapidly. In view of the increased cost of labor and material it is possible, however, that it may be necessary for them to announce higher prices, especially as the demand is very active and the mills are taxed to their full capacity. German Pattern Coil and Halter Chain of domestic manufacture is rapidly taking the place of the imported.

**Copper and Brass.**—The market for the various manufactures of Copper and Brass has witnessed some marked reductions since the first of the year, in sympathy with the radical declines in the price of Ingot Copper. Sheet Copper has declined 3 cents per pound, from 21 cents base to 18 cents, as at present. Sheet Brass and Brazed Tubes are each 5 per cent. lower, and Brass Wire and Rods 7½ per cent. lower, from the various lists governing the goods. Seamless Brass Tubes have declined 3 cents, while Copper Rivets remain at prices formerly made.

**Putnam Horse Nails.**—Putnam Nail Company, Neponset, Boston, Mass., in a circular relating to prices, January 1, announce that in response to the demand from the trade they have determined to put up their regular Putnam Nail with a sharp point under the brand of Putnam Hot Forged and Sharp Pointed Nail. These goods will be made of the same iron and by the same process as the old Putnam Nail, and will be packed in the regular Putnam boxes, with only the necessary change in the nomenclature to distinguish the Hammer Pointed from the Sharp Pointed Putnam Nail. Both styles of Nails are sold from the following list, which is subject to a discount of 33 1-3 per cent.:

| No. | 12 | 11 | 10 | 9 | 8 | 7 | 6 |
|---|---|---|---|---|---|---|---|
| | $0.18 | .18 | .18 | .19 | .20 | .21 | .23 |

| No. | 5 | 4½ | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| | $0.26 | .35 | .50 | 1.00 | 2.00 | 3.00 |

Neponset Sharp Pointed Horseshoe Nails are quoted at 12 cents a pound, all sizes from 5 to 10, instead of being sold by list and discount as heretofore. The above prices are subject to a cash discount of 2 per cent. if settlement is made on or before the 10th of each month for previous month's purchases. Freight will be allowed to points east of the Rocky Mountains in lots of eight boxes, f.o.b. to place of delivery, provided it does not exceed $1 per 100 pounds from Boston or 70 cents from Chicago warehouse.

**Binder Twine.**—Thus far no price has been established for Binder Twine by Eastern manufacturers, and very few are making quotations. Some Rope manufac-

turers have been running a few spindles on Binder Twine for the sake of economy, but no attempt has been made to accumulate stock. One concern quote on the basis of 10 to 10½ cents per pound for White Sisal and Standard Twine, as a price at which they would be willing to accept orders. Probably other makers would be willing to book orders at a corresponding figure. There have been a few inquiries by buyers, but no indication of any being ready to make purchases. At this time last year general quotations for White Sisal and Standard were 7¼ to 7½ cents, with a rebate of ¼ cent in carload lots, f.o.b. Eastern factory. It is reported that machine manufacturers are offering their customers options on Twine, to be settled for at the market price some time later in the season.

**Building Papers.**—There has been an average advance in Tarred Papers equivalent to about $2 a ton on Single Ply Tarred Roofing Felt and 5 cents a roll each on Two and Three Ply Tarred Felt. Prices seem to have advanced all over the country, although there are a few soft spots where competition is very keen. For the Eastern trade Single Ply Tarred Felt is $28 per ton; Two Ply, 50 cents a roll, and Three Ply, 75 cents per roll, delivered. The largest buyers at manufacturing points can shade these figures somewhat. Rosin Sized Sheathing, Deafening and Slaters' Felt and Water Proof Papers remain practically as they were, the prevailing weather exerting a deterrent effect on building.

**Cordage.**—Conditions ruling in the Rope market are unchanged, and prices are quoted on the former basis. Manufacturers are willing to make any grade of Rope ordered, thus using up their darker colored stock, this being particularly true of Manila. Such Rope may be made of pure Manila fiber, and answers for general agricultural purposes, though it is darker than the regular article. Quotations differ with various manufacturers, as follows, on a basis of 7-16 inch and larger: Sisal Rope, 8½ to 9¼ cents; Manila Rope, 12¾ to 13 cents, with ¼ cent per pound rebate allowed on large quantaties.

**Glass.**—The future status of Window Glass has not yet been determined. The following statement is reported to have been issued to the trade by the Independent Glass Company, regarding the expiration of the selling agreement with the American Window Glass Company:

> The selling agreement with the American Window Glass Company has expired by limitation. It will be the policy hereafter of the Independent Glass Company to sell their own product in whatever way they deem wisest and best, operate every factory to its utmost capacity and run just as long as the outsiders or the co-operatives.

A second meeting was scheduled to be held at Muncie, Ind., on January 4 for the purpose of inducing outside Glass manufacturers to come to an agreement regarding prices. This meeting was postponed, it is understood, until some time during the present week. The local Glass market is reported stronger than for some time, and Window Glass jobbers are hopeful that a price war may be avoided. There is little, if any, demand for Glass.

**Paris Green.**—While it is early in the season some inquiries have reached the manufacturers of Paris Green, but no orders have been placed. There is no agreement among the manufacturers, but the price being quoted is generally on the basis of 11 cents per pound in Arsenic kegs or casks, although some makers are not naming a price lower than 11½ cents. At the first of last year the price on the same basis was 12½ cents, which held quite firmly throughout the season. Makers are not anxious sellers, nor are they making contracts for future delivery at the present figures. Some of the manufacturers do not see any inducement to make up Green and carry it in stock for the convenience of the trade, but will fill orders as they are received. As far as can be learned stocks throughout the country are considered light. As to the future of the market Green may decline or advance, the latter being the more probable course of the market.

**Paints and Colors.**—*Leads.*—There is considerable competition among manufacturers of White Lead in Oil. The range of prices is from 6 cents per pound in lots of 500 pounds or over for special brands while other good brands are being sold at 5¾ cents. It is understood that a new brand is offered at 5½ cents for delivery later in the month. For less than 500 pounds the advance on all brands is ½ cent per pound.

**Oils.**—*Linseed Oil.*—On January 4 city crushers announced an advance on Raw Linseed Oil in five-barrel lots or more to 57 cents, and less than five-barrel lots to 58 cents per gallon. It is now held at 60 and 62 cents in five-barrel lots, according to makers. Out of town brands are selling from 59 to 60 cents in five-barrel lots. Flax Seed has advanced rapidly during the past few days, and it is generally supposed that this market is being manipulated to influence the price of Oil. Crushers, it is understood, have quantities of Oil on hand, and buyers are disgusted with the unwarranted advances in price. Indications point to higher priced Oil in the near future. The trend of the market for a number of years previous to the last two or three years has been toward lower prices from about the middle of February to the middle of March, when spring demand commences. Considerable interest is expressed as to whether manufacturers will be able to hold the market at a high level until spring demand sets in. Orders are now restricted to small lots, and this policy seems likely to rule during the existence of present conditions.

**Spirits Turpentine.**—The Turpentine market has continued strong at this point, owing to a similar condition ruling in Southern markets. There is an indication that consumers are more willing to pay present prices. The demand is moderate at the following quotations, according to quantity: Southerns, 39½ to 40 cents; machine made barrels, 40 to 40½ cents per gallon.

## RETAIL HARDWARE ASSOCIATIONS.

THE season of retail Hardware conventions is about here, and during the next month or two most of the State associations will come together in annual session. The Pacific Coast Association will initiate the movement by holding their convention about the middle of January at Nevada City. This will be the only January meeting, but February, as usual, will be a month of conventions, the Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, North Dakota, Ohio and Wisconsin associations convening during that month. The lately organized association in Pennsylvania will also hold a meeting in February. Information in regard to these different gatherings may be secured by those not at present affiliated with any of the organizations from the various secretaries, as given below.

Interesting and attractive programmes are being prepared for these conventions, and the officers feel confident that those who attend, either as members or visitors, will find the time and expense involved profitably invested. All the associations report healthy progress during the year, and are looking forward to a large expansion in the membership at the approaching meetings. It is to be hoped for the welfare of the trade as a whole that their expectations will be realized. While the movement toward organization among retailers for their own protection has shown a steady and gratifying growth during the past two or three years, there are still a good many merchants who have not affiliated with the movement and for one reason or another hold aloof. The time has come when the retail Hardware dealers of the different States should stand together in the correction of the abuses which beset the conduct of the business, and there is no better way of accomplishing this than

by becoming a member of a State association and holding up its hands in the good work in which it is engaged, and which requires so much of the time, energy and sagacity of its officers. The officials of the various associations are to be congratulated upon what they have thus far accomplished in placing the Hardware business in the different States in which organizations prevail upon a more equitable and satisfactory basis, and with the hearty and full co-operation of the trade much more can be done and with less friction and difficulty than in the past.

The following is a list of the State associations of retail Hardwaremen, with their officers. The list is an imposing one and also includes the National Association, of which many of the State organizations are members. We also give the date and place of the annual meeting where this has been determined:

ARKANSAS RETAIL HARDWARE DEALERS' ASSOCIATION.
*Third Wednesday in June, Little Rock.*
President, John M. Pitman, Prescott.
First Vice-President, J. F. Maxey, Ozark.
Second Vice-President, T. B. Stewart, Newport.
Secretary-Treasurer, J. A. Plummer, Marianna.

EAST TENNESSEE HARDWARE ASSOCIATION.
President, Jas. May, Sweetwater.
Vice-President, C. M. Reed, Athens.
Secretary-Treasurer, W. A. Jones, Greenville.

ILLINOIS RETAIL HARDWARE DEALERS' ASSOCIATION.
*February 12, 13, Decatur.*
President, H. G. Cormick, Centralia.
Vice-President, Wm. Bittel, Peoria.
Secretary, G. R. Lott, 1002 West Lake street, Chicago.
Treasurer, F. F. Porter, Chicago.

INDIANA RETAIL HARDWARE DEALERS' ASSOCIATION.
*February 19 and 20, Indianapolis.*
President, W. P. Lewis, New Albany.
Vice-President, Jas. L. Fulton, Portland.
Secretary and Treasurer, M. L. Corey, Argos.

INDIAN TERRITORY RETAIL HARDWARE ASSOCIATION.
President, Geo. W. Mowbray, Tulsa.
First Vice-President, J. G. Smith, Canadian.
Second Vice-President, Fred. Parkinson, Wagoner.
Treasurer, Sam R. Frazee, Vinita.
Secretary, Deck Miller, Poteau.

IOWA RETAIL HARDWARE DEALERS' ASSOCIATION.
President, W. A. McIntire, Ottumwa.
Vice-President, E. G. Penrose, Tama.
Secretary, W. H. Keating, Ottumwa.
Treasurer, Geo. Lister, Manchester.

KANSAS RETAIL HARDWARE DEALERS' ASSOCIATION
President, Geo. T. Anderson, St. Mary's.
Vice-President, Oscar M. Roehr, Topeka.
Secretary-Treasurer, J. A. Cole, Topeka.

KENTUCKY RETAIL HARDWARE AND STOVE DEALERS' ASSOCIATION.
President, Geo. Dehler, Louisville.
First Vice-President, J. S. Ogden, Ashland.
Second Vice-President, Chas. D. Winn, Paris.
Treasurer, Henry Heick, Louisville.
Secretary, Paul Wagner, Louisville.
Assistant Secretary, Wm. Dehler, Louisville.

MICHIGAN RETAIL HARDWARE DEALERS' ASSOCIATION.
President, H. C. Minnie, Eaton Rapids.
Vice-President, Geo. W. Bruske, Saginaw.
Secretary, Fred. H. Cozzens, Trade Building, Detroit.
Treasurer, Henry C. Weber, Detroit.

MINNESOTA RETAIL HARDWARE ASSOCIATION.
*February 26, 27, 28, St. Paul.*
President, W. H. Tomlinson, Le Sueur.
Vice-President, H. S. Cleveland, Minneapolis.
Secretary, Thos. McCracken, Boston Block, Minneapolis.
Treasurer, G. M. Evenson, St. Peter.

MISSOURI RETAIL HARDWARE DEALERS' ASSOCIATION.
President, B. F. Naylor, Marshall.
Vice-President, Geo. R. Plowman, St. Louis.
Treasurer, W. H. Halyard, Joplin.
Secretary, Fred. Neudorff, St. Joseph.

NATIONAL RETAIL HARDWARE DEALERS' ASSOCIATION.
President, W. P. Lewis, New Albany, Ind.
Vice-President, Geo. W. Hubbard, Flint, Mich.
Secretary, M. L. Corey, Argos, Ind.
Treasurer, H. G. Cormick, Centralia, Ind.

NEW ENGLAND RETAIL HARDWARE DEALERS' ASSOCIATION.
President, Geo. W. Burditt, Cambridgeport, Mass.
First Vice-President, S. D. Balkam, Jamaica Plain, Mass.
Second Vice-President, M. A. Chandler, Boston.
Third Vice-President, E. C. W. Bliss, Boston.
Secretary, Jas. A. Farless, 46 Oliver street, Boston
Treasurer, Henry M. Sanders, Boston.

NORTH DAKOTA RETAIL HARDWARE DEALERS' ASSOCIATION.
*February 19, 20, Fargo.*
President, H. T. Helgesen, Milton.
Vice-President, H. N. Joy, Hamilton.
Treasurer, W. H. Pinkerton, Lakota.
Secretary, C. N. Barnes, Grand Forks.

OHIO HARDWARE ASSOCIATION.
*February 25, 26, 27, Columbus.*
President, O. M. Scott, Marysville.
Vice-President, W. P. Bogardus, Mt. Vernon.
Corresponding Secretary, Geo. M. Gray, Coshocton.
Financial Secretary, W. C. Jones, Columbus.
Treasurer, H. G. Woodward, Sidney.

PACIFIC RETAIL HARDWARE ASSOCIATION.
President, John C. White, Marysville, Cal.
Vice-President, Oscar C. Schulze, Dixon, Cal.
Treasurer, Wm. Earll, Chico, Cal.
Secretary, Robert W. Boyd, Marysville, Cal.

PENNSYLVANIA RETAIL HARDWARE DEALERS' ASSOCIATION
*February 12, Pittsburgh.*
President, Geo. L. Moore, Brownsville.
Vice-President, Geo. J. Rudolph, Pittsburgh.
Secretary, J. F. Frye, Charleroi.
Treasurer, B. A. Maggini, Braddock.

SOUTHWESTERN KANSAS AND OKLAHOMA IMPLEMENT AND HARDWARE DEALERS' ASSOCIATION.
President, Chas. Watson, Pond Creek, O. T.
First Vice-President, John Baumstark, Harper, Kan.
Second Vice-President, I. H. Myton, Winfield, Kan.
Secretary-Treasurer, J. P. Dillon, Wichita, Kan.

TEXAS RETAIL HARDWARE AND IMPLEMENT DEALERS' ASSOCIATION.
President, W. H. Richardson, Austin.
First Vice-President, J. D. Hefley, Cameron.
Second Vice-President, C. Dickson, Cleburne.
Secretary-Treasurer, Jas. G. Blaine, Taylor.

WASHINGTON HARDWARE ASSOCIATION.
President, Henry Mohr, Tacoma.
Vice-President, F. M. Scheble, Wenatchee.
Secretary, D. G. O'Brien, Seattle.
Treasurer, C. W. J. Reckers, Seattle.

WISCONSIN RETAIL HARDWARE DEALERS' ASSOCIATION.
*February 5 and 6, Milwaukee.*
President, John Hessel, Antigo.
Vice-President, Otto Schlafer, Appleton.
Secretary, C. A. Peck, Berlin.
Treasurer, George Leverenz, New Holstein.

## REQUESTS FOR CATALOGUES, &c.

*The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

Joseph Candor, dealer in Hardware, Oils, Paints, &c., Lock Haven, Pa., advises us that his collection of catalogues and price-lists has been damaged by water, and he is desirous of replacing it. He will accordingly be pleased to receive printed matter and discounts covering general Hardware, as well as Railroad and Contractors' Supplies.

A. B. Ware & Co., Opelika, Ala., have disposed of their retail department to Brownfed Bros., and will hereafter do an exclusively wholesale business in Hardware, Crockery and Wooden Ware. They have leased a warehouse on railway track, 38 x 350 feet, and commenced operations on the 1st inst. with a cash capital of $20,000. The firm request catalogues and quotations in regard to the above lines.

Bewley Hardware Company, jobbers and retailers of Hardware, Agricultural Implements, Stoves, &c., Chester, S. C., have applied for charter with privilege of increasing capital stock from $10,000 to $25,000.

# NOTES ON FOREIGN TRADE.

## BRITISH LETTER.

Offices of *The Iron Age*, Hastings House, Norfolk St., London, W. C., Dec. 21, 1901.

### Useless Receipts.

WITH regard to the correspondence at present proceeding in the columns of *The Iron Age* with reference to superfluous labor in sending receipts for checks or drafts, it is perhaps not known to American traders that it is not uncommon in this country for a regular receipt form to be attached to the check. I should say roughly that most of the big houses who send checks to this office have attached to them a receipt form. I receipt the check at the bottom and indorse it at the back, and that is all that is necessary. Some firms go so far as to request me to send no other receipt. I do not know if this method has yet reached America, or even if it comes from America; it is certainly safe and effective.

### Smart Agency Work.

A smart piece of agency work has just come before my notice. The A. P. Smith Mfg. Company of Newark, N. J., have as agents over here Clark-Harrison & Co. of 72 Fenchurch street, London, E. C. The London agents determined to exhibit the goods of this company at the Sanitary Institute in London. The exhibits arrived by steamer from America in the Thames on Monday, October 14. They were ready for exhibition on Tuesday night, the exhibition opening on Wednesday morning. The result is that the No. 1 Smith machine for making connections to water mains while under pressure has received the highest award made by the Council—viz., a silver medal. Through the courtesy of the engineer of the East London Water Works a practical demonstration was given of these goods. Clark-Harrison & Co. inform me now that there is a large inquiry for the Smith machines throughout the United Kingdom.

### Cinder Sifters.

The Cinder Sifter is, of course, a British institution. Where so many fires are kept going in every house all through the winter it is, of course, necessary to economize by sifting the cinders. To this end a number of Cinder Sifters are on the market. It is complained that one firm making these goods are too independent. They advertise net prices for the general public and reserve a 10 per cent. margin if the goods are bought through the ironmonger. An appeal is now made in an English trade paper to boycott the firm in question as being unfair in their trading. Has any American house a Cinder Sifter carrying 25 per cent. profit to the retailer?

### The Coming of the Radiator.

Apropos of the last paragraph, the high price of coal is turning householders' attention to heating by radiation. During the past fortnight I have received three letters asking for the address of an American radiating firm, while yesterday afternoon a gentleman called to ascertain if he could obtain the agency of any American firm making Radiators. Having, as he assures me, a good connection with architects and large contractors, he is convinced he can drive a big trade. I was also struck with the fact that two out of the three inquiries for Radiators came from gentlemen who had recently returned from the United States.

### A Significant Resolution.

The Kidderminster Chamber of Commerce have, with one dissentient, passed a resolution in favor of imposing a protective tariff on all imported goods. It may be remarked that had this resolution come up five years ago it would in all probability have been vetoed without a division. Signs are not wanting that the commercial organizations of this country are at the present time being thoroughly worked by fair traders and protectionists. Thus, at a public meeting at Darlaston, which is in the heart of the black country, a local manufacturer remarked that there had been a serious influx of foreign work going into that district. German Bars and French Nuts and Bolts were being sent over in large quantities, and there was a great amount of competition in the Tube trade in Wednesbury and elsewhere. In his opinion it was exceedingly unfair that foreigners should be allowed to dump down their goods in this manner without paying any taxation such as English manufacturers had to bear. The local Parliamentary representative added that he recognized that the question of protection of manufactured articles was on a different basis from that of the taxation of food, but the difficulty which had always to be faced was that if one thing was protected there was always a demand for similar consideration for some other industry. Personally, he looked to the time when British colonies would be more developed and a preference would be given to British goods wherever made inside the empire. One need not attach too much significance to these and many similar resolutions, but they are at all events straws showing in what direction the commercial wind is blowing.

### Freight Rates in the East.

A firm of merchants in China, writing to a Glasgow export house, say: "Regarding an invoice for goods, value £700 at Glasgow, the outlay for freights and charges from Glasgow to Shanghai was in excess of the value of the goods and almost double the charge that would have been made if we had obtained them from the United States of America, and eleven times the cost of freighting from Japan." This correspondent further adds that the Japanese goods have given great satisfaction, and in view of the saving of the excessive rate of freight, this particular line of goods will probably be lost to this country. But the point to which I would draw attention is that the freightage from the United States shows a considerable saving upon that from the United Kingdom. This adds point to much that I have said upon the prospects of American trade in the far East.

### Trade in the Orient.

Altogether it is important for American exporters to watch every trade development in the Orient. I have repeatedly referred to India. Another country destined to have a commercial future is Siam. In 1826 a commercial treaty was signed between the King of Siam and Great Britain. In 1855 another treaty of friendship and commerce was signed, and British subjects in Siam were put under the control of a consul resident in Bangkok. Other countries followed, Japan and Russia being added to the list in 1898 and 1899. In January, 1896, an agreement was arrived at between England and France in which both countries bound themselves not to invade the central part of Siam or allow any other power to do so. This agreement has materially added to the commercial stability of this interesting country. The Siamese have a system of elementary and higher education which in point of efficiency is far beyond any neighboring country. The sons of the late King have all been educated in Europe. Some of them have passed through British public schools and are now students at the universities, while there is a constantly flowing stream of Siamese Government students who take an educational course in Europe or in England, and, upon returning to Siam, turn their knowledge to account in Government offices. In 1895 Siam imported $2,150,000 worth of cotton goods. Last year the figures rose to $3,500,000. It follows, of course, that if they are buying this large quantity of cotton, it will not be long before they are buying Hardware. Indeed, last year the total imports into Siam amounted to $12,800,000. The exporting medium of value possessed by Siam is teak. In 1900, 40,000 tons of this was exported at an average value of $50 per ton. As nearly all the great Oriental steamship companies either trade direct to Bangkok or have subsidiary steamers going there it seems reasonable to suppose that trade may be developed.

### State of Trade.

Most commercial travelers are now home for Christmas, and work is slacking off in all directions. As an evidence of how the war affects domestic trade an influential traveler in the Hardware building trade in Southern England says that he finds evidence of vitality in South Hampshire and in Devon, but between them he considers that parts of Dorsetshire and the whole of

Wiltshire have been seriously affected by the war. In some places the heavy drain upon the manhood of the agricultural districts has led to a poorer crop than for many years, there being insufficient labor available to attend properly to the operations of sowing, harrowing and harvesting. Moreover, there has been a large contingent furnished by these counties to the Imperial Yeomanry and the regular forces in the field, and in these circumstances the putting aside of their personal interests on the part of gentlemen farmers has been very marked. The amount of building that is in contemplation in the district between Oxford and Plymouth during the next twelvemonth is believed to be smaller than for many a year. Many works will not be opened for a fortnight from to-day.

**Tool and Cutlery Steel.**

Once or twice during my recent trip to your country I was struck with the large amount of Sheffield steel still in use in American Tool and Cutlery works. The subject is an important one, and I therefore draw attention to some comments made by David Flather of Sheffield in a paper on crucible steel recently read before the Staffordshire Iron and Steel Institute. One point he makes is that it is very usual for crucible steel orders to be rerceived which simply specify the weight and size of the steel required, leaving the manufacturer to guess at the kind of work it is to do. For example, crucible steel is oftentimes ordered "for tools." This reticence leads to endless mistakes, and it should be a fixed rule in ordering from the crucible steel manufacturers to state specifically for what it is required. The process of hardening requires the greatest care from beginning to end, an absolute, certain judgment of heat color, careful manipulation, and a thousand and one little tricks and devices according to the shape and size of the tools required. David Flather says that with the new class of tool steel used for machine work at the Paris Exposition, 1900, when the Bethlehem Steel Company showed tools at work on mild steel shafting at a cutting speed of 150 revolutions per minute without lubricants, so great was the strain on the tool that its point was distinctly red hot, and the turnings when cold were a dark blue color —an evidence of the great heat generated. As a matter of fact, when working at this speed the tool did not actually cut at all, but wedged off the turnings. In addition to this, the Sheffield method of hardening is very simple and could be carried out by any tool smith who was accustomed to work high carbon steel.

## INTRODUCING BUILDERS' HARDWARE ABROAD.

THE following incident, which was one of many in the business trip of J. H. Cherry of Sargent & Co., New Haven and New York, recently completed, extending over a period of about 18 months, is full of instruction and significance to any manufacturer the extent of whose output warrants sending an especially qualified salesman abroad to introduce his product. It also illustrates how much more efficient is this method than relying on correspondence, trade literature or representatives acting for a number of concerns, who have neither the time nor the special knowledge required to overcome native prejudices and secure trial orders. The main difficulty he found was to get the trade interested to the buying point in many articles of their manufacture, a leading feature of which is Builders' Hardware. To make a thorough test of this matter, Mr. Cherry was equipped with a very complete assortment, his line of samples aggregating 2½ tons cubic measurement. When approached by Mr. Cherry, as a rule, the dealers said they never saw anything like his display in their experience, but they could not think of stocking the goods, as their shelves were full of English goods that were already introduced, and they had not the time to waste educating people up to the use of radically different articles, even if they were admittedly better for the purpose. They expressed no hostility to his seeing architects and large consumers with a view to creating a market, but were not willing to do the pioneer work themselves. They would, however, cheerfully buy the goods if there was sufficient demand for them.

In Adelaide, South Australia, there was in progress of erection a stock exchange building; not such a building as would be found in New York for such a purpose, but of fairly good proportions and two stories high. The architect, Mr. Dunn, was invited to look over the exhibit, for which he expressed great admiration, saying, "I would specify those goods if they were carried in stock, but we cannot wait to import them." In this particular case there would be an interval of four months before the Hardware was needed, so, finally, after selecting one of the best patterns, an Empire design in a silver finish, Mr. Cherry was permitted to make an estimate for the entire building so as to have the entire Hardware trim in harmony, he being furnished with the drawings and specifications on which to base it. When the estimate was submitted the architect was somewhat astonished at the figures. He said, "My contracts are all closed and I had allowed about £40 ($200) for the Hardware." Mr. Cherry's estimate was considerably in excess of those figures. He added, "I cannot ring in any bill for extras on the Building Committee like that when the accounts are to be settled." Mr. Cherry suggested that he bring the Committee of Brokers (12 in number) down to his rooms to see what had been selected. This was accomplished; the brokers were charmed and captured, they ending the conference by saying, "Go ahead, Mr. Dunn; make your selection and we will pass the bills for payment." What happened in this case was equally true in others elsewhere whenever he could get the attention of architects, builders and consumers—that is, well to do men and often their wives—who were putting up fine business buildings or residences. In about 40 such cases in Melbourne, where he secured the attention of the architects, he got every order but one where there was sufficient time to import the goods, say four months or more. The exception in that case was an architect who was so well pleased with the trim that he was about to decide on accepting it for the building where the Duke of York was to hold his reception, when his English patriotism caused him to pause at American Hardware for a building in which a member of the reigning English family was to receive British subjects on so momentous an occasion.

## STRONG & TROWBRIDGE COMPANY.

STRONG & TROWBRIDGE COMPANY, 21-24 State street, New York, export commission merchants, are now directly represented in three important European markets; Cologne, by N. J. Kirch; Paris, H. D. Martin, 23 Boulevard des Italiens, and Milan, by A. L. Riatti, in addition to their regular London branch, long established, and in charge of their own officials.

The Paris house covers France, Spain and Portugal; the Cologne branch covers Germany, and the house in Milan looks after Italian interests. These markets differ radically along the lines of manufactured products. Shoes and furniture, especially office furniture, such as bookcases, both regular and sectional, and office chairs, are being successfully marketed. The opinion is expressed that Hardware will be a good line for France. It has been kept out, for one reason, and again no one seems to have pushed it. On Cameras, specialties and patented devices France, Germany and Italy put on a stiff duty. Genoa, Naples and Leghorn are all free ports—that is, goods from abroad pay no duty until they go outside the city limits, as is the case with Hamburg and Bremen. Italy buys large quantities of cotton seed oil, sulphate of copper, maize, wheat, pork, lard, greases, fertilizer, and the trade in coal is growing. The above remarks in a general way apply to the South of France, as Marseilles, &c.

Murray & Co. have succeeded Murray & Hall in the Hardware, Stove and Farm Implement business at Winters, Texas. The new firm have enlarged the store, thus materially improving their facilities.

# Letters from the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

## Goods for Export Diverted to the Home Market.

The following communication from a prominent Hardware manufacturer refers to the manner in which goods which are sold ostensibly for foreign trade and at lower prices than are ruling in this country sometimes find their way into the domestic market:

There is a practice more or less prevalent among a certain class of exporters, to which I have seen no reference in your columns, but which, for the interests of your manufacturing subscribers, should be thoroughly exploited. I refer to the practice of purchasing goods ostensibly for export, but actually intended for sale and consumption in the United States.

Those actively engaged in manufacturing will readily appreciate the necessity for selling some lines of goods at lower prices for export than for domestic markets—for instance, in the manufacture of iron and steel we find many articles upon which the labor cost is very high, thus making an impelling incentive for large investment in the most perfect tools and machinery, the economical use of which necessitates a large output, in many cases larger than is afforded by the United States market.

In selling such a product the only alternative confronting the merchant-manufacturer is to make a uniform selling price for home and abroad, such as will net him a fair profit, in which event the price may be so high as to reduce the consumption, or to produce irrespective of the market in the most economical way, which, of course, is to the limit of his machinery, and then sell all the domestic market will take profitably and sell the surplus abroad at lower prices. I think it will be conceded that the latter course is the most practical, and, in the end, the most beneficial for consumers in this country.

There is a class of morally irresponsible exporters who take advantage of such a condition to purchase for export and divert their purchases to the domestic market at cut prices, thus disturbing market conditions and inflicting injury upon the manufacturer. The methods adopted in securing the goods are many and devious, the latest of which, I have been informed, would do credit to the childlike innocence of the proverbial Chinaman.

A street broker, with no standing in the trade, solicits and takes orders from jobbers at cut prices. These orders are turned over to an exporter of questionable standing, who in turn hands them to an exporter of fair standing, to be passed by him to the manufacturer. Of course the form of adopting marks and name of port of destination is preserved between the exporters, and they appear on the orders and cases, these marks indicating a destination which will pass the scrutiny of the manufacturer when he receives the order.

I am informed that additional precautions against discovery are taken when high priced goods are desired, even to the extent of actually having them shipped to a European free port and returned duty free by an agent in the free port.

I am also informed that in the event of a manufacturer tracing the irregularities, a cloak is used by his customer to hide his interest in the scheme, the claim being made that he simply financed the middle exporter in the transaction, having no knowledge of the irregularity.

I should like to see a full discussion of this subject, believing the evil to be greater than commonly supposed.

If there are manufacturers having experience along this line, I should like to hear from them.

MANUFACTURER.

## Postage in Cities.

The following communication from a prominent Hardware house in Kansas relates to the communication presented in our issue of the 19th inst.:

We heartily indorse the letter of Wm. R. Belknap of Louisville, Ky., which appeared in *The Iron Age* of December 19, suggesting that the time had come for 1-cent postage on drop letters in cities. We have always thought it unjust to be required to pay 2 cents postage on a drop letter when the postage was no more for carrying the letter 5000 miles. At country offices and in cities without free delivery drop letters are but 1 cent. We know of cities of about 5000 population that do not have free delivery, and the merchants and business men don't want it so long as it carries with it a 100 per cent. increase in cost of drop letter postage.

A merchant in Maryland makes the following suggestions with reference to desirable modifications in postal usages:

While postal charges are under discussion we wish to ask that calendars and other low class matter be returned to sender, when addressee is not found, if sender agrees by notice on parcel to pay for return. At present sender must request that notice of non-delivery be sent to him and agree to forward return postage for the unclaimed parcel.

We think this would not be an addition to the present postal deficit, which should be eliminated by higher rates for matter now carried at the expense of the taxpayer instead of the sender, and would be of much value to the sender.

The following letter from a leading Western manufacturer indorses the suggestion in favor of 1-cent postage in cities:

The suggestion made in yours of December 19 by Mr. Belknap that postage on drop letters at carrier post offices be made 1 cent per ounce is just the right thing. There has been some agitation about letter postage being reduced to 1 cent throughout the country, but this is impracticable owing to the loss of revenue. I believe the experiment can be tried in cities, and then in time it could be further extended. Some years ago—I believe in 1880 or 1881—we were allowed to send invoices for 1 cent, and it was a great convenience and saving. One-cent postage within cities would enlarge the volume of business greatly without adding a proportionate amount of expense, and would greatly facilitate commercial transactions. As against competition of the telephone I believe the Government should make this experiment.

## Receipts for Remittances

The following communication from a Hardware house in New Hampshire mentions some objections to the practice of discontinuing sending receipts for remittances as the matter is seen from our correspondent's standpoint:

We have noticed articles in *The Iron Age* on the subject of manufacturers and jobbers not sending receipts for remittances in payment of invoices, looking upon the indorsed check sent as receipt enough. How does that work when payments are made with bank drafts, which, of course, go back to the bank? There is great effort made now to have all payments in that manner, many refusing to take private checks.

It seems to us that it is very much better to have a receipt. We pay, as is universal now, by sending statement on remittance blank with items, often two or three, and deducting cash discount and any overcharges or shortages. That blank we want back receipted, as we often want to look back for some reason to the statement. If the merchant has no receipt and the cashier's check is in the bank he is badly off.

We also want to know at the time whether parties have received the remittance and not have to wait to find out until perhaps two months or so afterward, when they send statement with notice of draft or a request

for payment. The proposed way would work to the advantage of large manufacturers or jobbers to save expense, but we don't think their customers would like it. We should not.

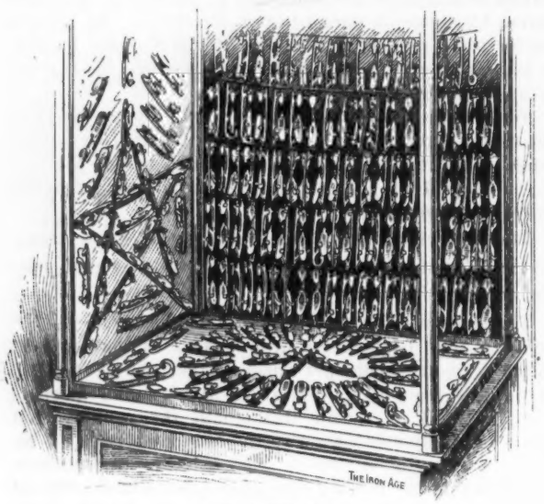
### Plural of Tailors' Goose.

The following inquiry relating to a matter which has perplexed some Hardware merchants and has been the subject of facetious treatment is referred to our readers:

We are offering a chance on a set of Sad Irons to any person who will give us the correct wording of an order for six Tailors' Goose, or Geese, or the plural of goose. Wish you would give us the proper wording and oblige, that we may give the prize to the right party.

## A SKATE WINDOW.

Sales of Skates can be greatly increased by window displays. The accompanying drawing was made from the description of a successful window furnished by J. S. Davenport & Son, Stamford, Conn. In preparing this window the side wall is covered with white cotton




*A Skate Window.*

flannel. On this Skates are arranged in a set design. The floor of the window is also covered with cotton flannel and on it is made another design with Skates. Wires are hung horizontally across the back of the window and from these Skates are suspended as shown in the illustration. Windows like this, it is claimed, sell a great many more Skates than would be sold if the special attention of the public were not attracted in some such special way.

## PRICING STOCK IN PLAIN FIGURES.

A correspondent who is connected with a store in one of the Connecticut cities writes:

I have read the article on show window display by J. C. Sarchet and would like to take exception to some of his ideas on this subject. I do not think that a large variety of goods in a show window is as effective as a small variety and a lot of it. I find that it pays me to mark my goods in plain figures as to the selling price, as when so doing the general public places more confidence in me.

Another point: I had an extra clerk here before the holidays, and in the midst of one of my busiest evenings he was taken sick. What did I do but ask a bright friend to help me out. As my goods were marked plainly he stepped right in and sold goods as well as an experienced clerk. What would I have done if my goods were all marked with private marks? BOOKKEEPER.

George Thornton has sold his interest in the firm of Thornton & Freeborn to L. W. Rich. The new firm of Freeborn & Rich will increase the already large stock of Hardware and Builders' Supplies.

## MILLER, SLOSS & SCOTT'S ANNUAL BANQUET.

THE tenth annual dinner of Miller, Sloss & Scott, San Francisco, which business with that of Geo. W. Gibbs Company was consolidated January 1, under the style of Pacific Hardware & Steel Company, was held on December 30. The *menu* was an excellent one. About 80 persons comprised the gathering. A souvenir card issued in connection with the dinner supplied the names of those present and their positions at the table on one side, while the other side was embellished with a number of ludicrous sketches of the members of the company and some of the employees. These sketches, coupled as they were with suppositious remarks by the parties thus caricatured, were much appreciated and contributed not a little to the gayety of the gathering.

## BANQUET OF FARWELL, OZMUN, KIRK & CO.

THE fifth annual banquet of Farwell, Ozmun, Kirk & Co., St. Paul, was tendered their employees on the 30th ult. at the Hotel Ryan. The house has 300 employees, 53 of them being traveling salesmen. Some of the resident salesmen on the Pacific Coast were not present and others were prevented from attending for other reasons, so that the number at the different tables was about 280. Interesting addresses were made by President R. A. Kirk and Vice-President C. H. Bigelow. Mr. Kirk, in concluding the exercises, made a very earnest appeal to the guests concerning the work ahead of them during the present year. The banquet was the largest and most successful of the series, and was thoroughly enjoyed by all.

## AMONG THE HARDWARE TRADE.

Thos. Naylor, having disposed of his business at Boyne City, has bought the general store of D. Mills, Gladwin, Mich., and is carrying a line comprising Hardware, Stoves, Bicycles, Tinware, furniture, groceries, dry goods, &c.

James G. Geagan, who was for 16 years with Clancy Bros., Syracuse, N. Y., and for 13 years was their sole representative on the road, has secured an interest in the Drennan-Briggs Hardware Company, 325-327 West Fayette street, of that city, the name of which was changed to the Drennan Hardware Company January 1. Mr. Geagan will act as general manager. In addition to the line of Iron, Steel, Heavy Hardware, Galvanized Iron and Tin Plate now carried by the firm, they will put in a complete line of Wagon Wood Work and Carriage Makers' Supplies.

On January 1 Tracy, Robinson & Williams succeeded the old firm of Tracy & Robinson, who have for many years carried on a large and successful wholesale and retail Hardware business at 78 and 80 Asylum street, Hartford, Conn. Mr. Williams has been identified with the house for the past ten years and is thoroughly familiar with all the details of the business.

A. A. Rumreich has succeeded the firm of F. P. Rumreich & Son in the Hardware, Stove and Sporting Goods business in Pisek, N. D. The store room has been materially increased in size and a tin shop added, 22 x 14 feet in dimensions.

William Bauer and Henry Schluckebier have dissolved their partnership in the wholesale and retail Hardware, Agricultural Implement, Stove and Wagon and Buggy business in Petaluma, Cal., and it will hereafter be continued by Mr. Schluckebier under his own name.

A. B. Ware & Co., Opelika, Ala., have disposed of their retail business to Brownfed Bros., who will continue at the old stand. A. B. Ware & Co. will hereafter do an exclusively wholesale business in Hardware, Crockery and Wooden Ware.

# Scofield Company's Price System.

THE care of prices, both buying and selling, has been considered worthy of a great deal of thought by Scofield Company of Sturgeon Bay, Wis. They have introduced a system by which a record of cost and uniform selling prices is maintained. The selling prices of articles are so clearly shown by this system that the most inexperienced clerk in the establishment need not hesitate to give the price on any article in stock.

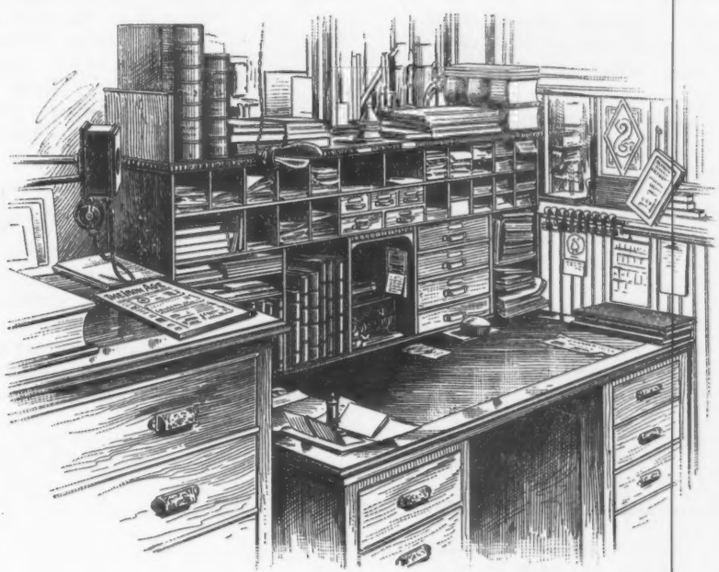


*Fig. 1.—Buyer's and Cashier's Desks.*

### The Office.

The system of buying and selling prices centers at the buyer's or manager's desk, and the desk of the cashier in the office, which is situated near the center of the store.

BUYER'S DESK.—The desk to the right in Fig. 1 is the buyer's and was specially made by a local cabinet maker. The pigeon holes and drawers were arranged with a view to the particular use to which they were to be put. There is one pigeon hole for each staple article, as Oil, for instance, and every card or letter referring to an advance or decline in price is put in the proper opening. Thus the prices are at instant service, the latest one being on the top.

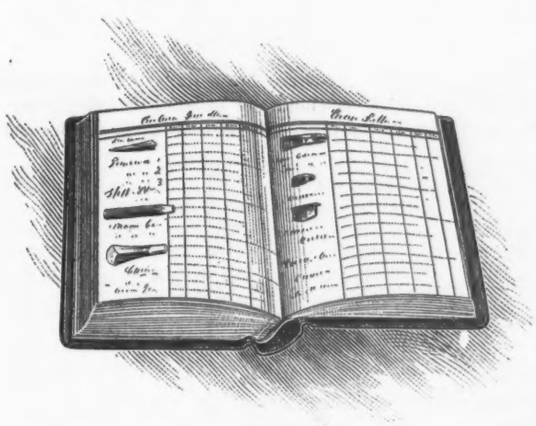


*Fig. 2.—Price-List of Stock.*

OTHER RECEPTACLES.—Additional places are provided for carbon order books furnished by wholesale houses; addressed envelopes of concerns from whom goods are purchased; drawers for stationery, stamps, &c.; also for price-lists and mailing slips which are inclosed with letters to customers. Apartments are provided for catalogues of the handy pocket sizes so much in vogue, and for circulars and pamphlets that are temporarily kept. Large Hardware and general catalogues are kept on the top of the case, together with a file of *The Iron Age* for several months back.

The latest copy is always to be found on the corner of the cashier's desk, as shown.

DRAWERS.—The drawers under the desk, to the left, hold bills, statements, copies of orders, future orders, &c., while those to the right are devoted to price-lists, those of catalogue houses occupying the top drawer.

### Selling Prices.

The selling prices of certain classes of goods, especially staples upon which prices are constantly changing, are kept in a set of five books. The books are adapted to the several lines of goods carried in stock, one being devoted to these in each department. The division of the stock is as follows: General, Fitting and Plumbing, Pumps, Stoves, and Paints.

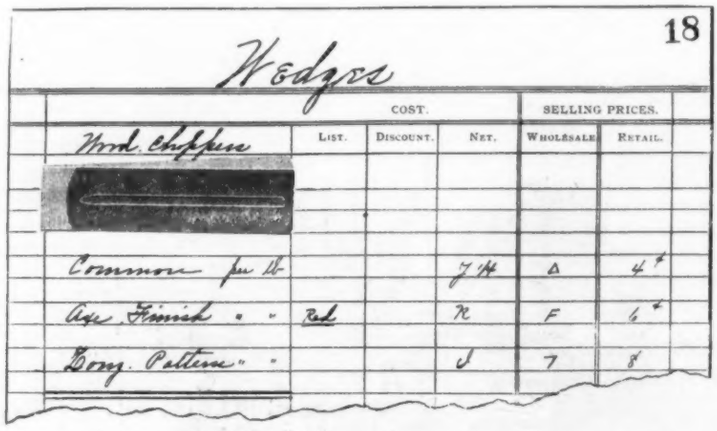
PRICE-LISTS OF STOCK.—The books, one of which is illustrated in Fig. 2, are made of the best bond paper and bound in a substantial manner with flat opening steel backs and heavy stiff covers of red leather. Each book is provided with an index, with letters on leather tabs extending beyond the leaves, so that when opening the book it is not necessary to touch the paper with dirty or greasy fingers. The present set have been in use three years and are still in a good state of preservation. The company first used a single volume, but found it too large and that delay was caused by one salesman waiting for another to use it. These books are kept in the opening at the left of the ink stand, convenient to the telephone, which is on the cashier's desk, so that inquiries about prices by telephone can be readily answered. The telephone is a long distance desk 'phone, and can be moved around at pleasure.

PAGES OF PRICE-LISTS.—Reproductions, reduced, of portions of pages from the General, Pump and Stove price-lists, shown in Figs. 3, 4 and 5, serve to convey an idea of how the books are arranged, the ruling of each of those shown being different. The page illustrated in Fig. 3 is the one from the General price-list, devoted to Wedges. Small cuts are taken from catalogues and pasted in, with prices filled in with lead pencil, so as to be easily erased and changed when necessary. In addition to the common Wedge the balance of this page shows Truckee and Oregon patterns, also Saw Wedges.

ILLUSTRATIONS.—The dullest salesman can tell from the illustrations which is the Truckee price, or the Oregon price without being told, whereas if there were no illustrations he might be at a loss which was

which. Under such circumstances a sale might be made at a loss or a customer might be lost by asking a Truckee price for a common pattern Wedge. This rule holds good in the other price-lists, the illustrations making it plain which goods the prices belong to.

PUMP LIST.—The page from the Pump price-list, Fig. 4, not only shows the picture and price of Pitcher Spout Pumps, but the size, description and cut of plunger, handle bearing, body, base and handle. This detail is found necessary only with this kind of Pump. The next page is devoted to Three-Way Pumps, with handles as an extra, this being the only repair usually called for. A printed description of the Pumps, cut from a catalogue, serves to answer the questions generally asked regarding the size of cylinder, suction, stroke, depth of well, &c.



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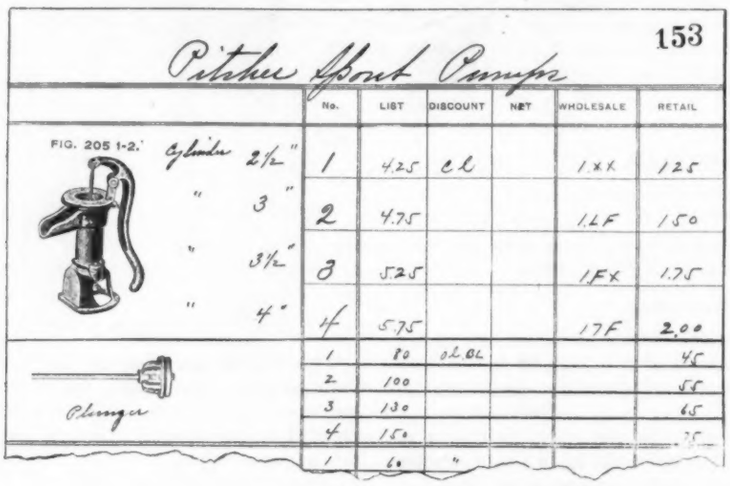
Wedges

| | COST. | | | SELLING PRICES. | |
|---|---|---|---|---|---|
| Wood Choppers | LIST. | DISCOUNT. | NET. | WHOLESALE | RETAIL. |
| Common per lb | | | 7 1/4 | A | 4¢ |
| Axe Finish " " | Red | | R | F | 6¢ |
| Long Pattern " " | | | J | 7 | 8 |

*Fig. 3.—Page from General Price-List.*

UNCERTAINTY.—It is no unusual occurrence in a retail store to hear one clerk call across the room to another asking, "What are these Hinges worth?" or "Where can I find the price of these Crow Bars?" The chances are that the clerk of whom the question is asked leaves his work to help the other one find the price on the edge of the box or on the wall. If the price is not found, but guessed at, the customer is in doubt whether he has paid the correct price. Many profits are lost by not having the right price available.



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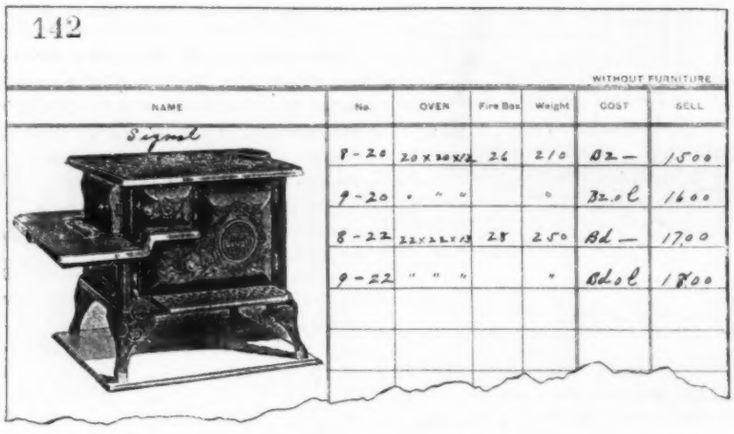
Pitcher Spout Pumps

| | | No. | LIST | DISCOUNT | NET | WHOLESALE | RETAIL |
|---|---|---|---|---|---|---|---|
| FIG. 205 1-2. | Cylinder 2½" | 1 | 4.25 | cl | | 1.XX | 1.25 |
| | " 3" | 2 | 4.75 | | | 1.LF | 1.50 |
| | " 3½" | 3 | 5.25 | | | 1.FX | 1.75 |
| | " 4" | 4 | 5.75 | | | 1.7F | 2.00 |
| Plunger | | 1 | 80 | 0L.0L | | | 45 |
| | | 2 | 100 | | | | 55 |
| | | 3 | 130 | | | | 65 |
| | | 4 | 150 | | | | 75 |
| | | 1 | 60 | " | | | |

*Fig. 4.—Page from Pump Price-List.*



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| NAME | No. | OVEN | Fire Box | Weight | WITHOUT FURNITURE COST | SELL |
|---|---|---|---|---|---|---|
| Spout | 9-20 | 20 x 30 x 12 | 24 | 210 | 02— | 1500 |
| | 9-20 | " " " | | " | 32.0l | 1600 |
| | 8-22 | 22 x 32 x 13 | 28 | 250 | 8l— | 1700 |
| | 9-22 | " " " | | " | 8l.0l | 1800 |

*Fig. 5.—Page from Stove Price-List.*

### Cost Prices.

It will be seen by Figs. 3, 4 and 5 that the cost of the goods is given in the price-lists, so as to serve as an invaluable guide when purchasing. The record of the former cost is worth all the time and labor expended, for

*Fig. 6.—Change Slate.*

comparison with the price asked. A traveling man is most likely to quote his lowest prices when he knows the buyer has a record for ready comparison at hand.

### Change Slate.

Near the buyer's desk, hanging in plain sight, is a slate, shown in Fig. 6, ruled in two divisions, one headed "Decline" and the other "Advance." When a change in staple articles occurs the date and name of the article affected is written on the slate under the proper heading. The slate serves as a bulletin board advising salesmen of a change in price, for which they must refer to one of the price-lists. It prevents clerks selling from memory and at variance with the new price.

*Fig. 7.—General Price Tag.*

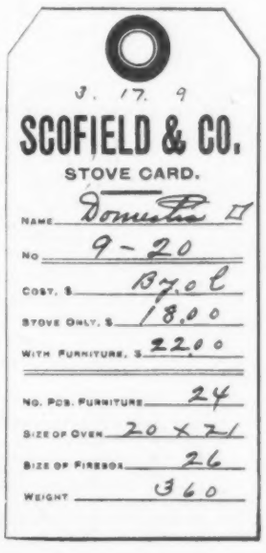


*Fig. 8.—Stove Price Tag.*

### Order Books.

In the receptacle at the left of the case, below the top row of pigeon holes, four order books are kept. These are for Stove Repairs, Pumps, Furnaces and Wind Mills.

ESTIMATES.—In addition is a book for estimates, in which the first entry is made in pencil, and in which all figuring on bids is done. From the estimate book a copy of the bid is made for the customer, a duplicate being filed.

STOVE REPAIRS.—The Stove Repair book is, as its name implies, a book for entering all orders for Stove Repairs. When the Repairs are received the weights, cost and selling prices are entered opposite each part for future reference.

THE OTHER BOOKS.—The other order books indicate, for reference, the size of each Pump, Furnace or Wind Mill, number, &c., job put out, what repairs ordered or new parts required.

### Tags and Cards.

There are many articles, most of them small, the price of which it is not practical or necessary to mark in the price-lists. Such goods are marked with tags or cards illustrated, reduced, in Figs. 7, 8, 9 and 10. The tags are of linen and practically indestructible. The one shown in Fig. 7 is for general goods, the other two for Guns and Stoves.

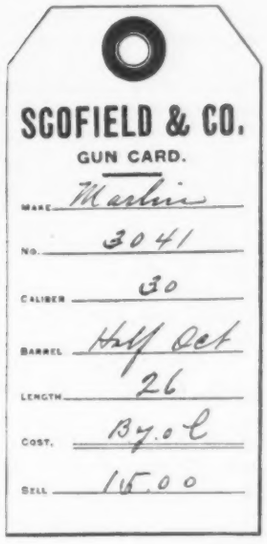


*Fig. 9.—Gun Price Tag.*

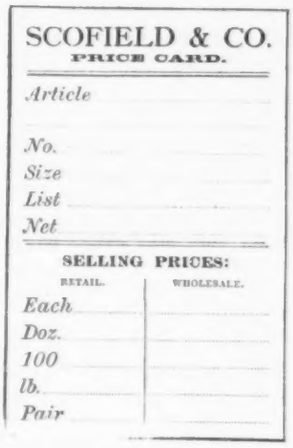


*Fig. 10.—General Price Card.*

PRICE CARDS.—The price card, Fig. 10, is used on shelf boxes and on goods which do not have the price marked on the article or tags.

### A Successful System.

The foregoing system of prices has been thoroughly tested and found satisfactory with a large and varied stock of Heavy and Shelf Hardware, Cutlery, Sporting Goods, Iron and Steel, Wood Stock, Paints and Oils, Mill and Vessel Supplies, Steam Fittings, Furnaces, Pumps, Wind Mills, Stoves, Ranges and Ship Chandlery.

## LOANS TO TRAVELING SALESMEN.

THE communication given below is from a well-known jobbing house. It refers to a subject of some interest to jobbers and manufacturers to whose salesmen loans are sometimes made by their customers:

One of our salesmen, without our knowledge, became addicted to bad habits—borrowed money from some of our customers—in one case he borrowed $200. The loans were made as personal loans to this salesman, but the customers now claim that we are morally responsible for it and want us to pay them.

We claim that we employed the salesman to sell goods and not to borrow money—that if we were to pay this claim it would be establishing a bad precedent by admitting our responsibility—something we are unwilling to do. Further than that, if these customers of ours shall lose their money by having made an indiscreet loan, which they did of their own motion and on their own responsibility, it would probably prevent them from repeating it, and they will have paid for their experience, but as this is probably a most interesting question, I will be glad to have you submit it to your readers, with the hope that there will be a full and free discussion of the subject.

A HARDWARE JOBBER.

## CALENDARS, &c.

SIMONDS MFG. COMPANY, Fitchburg, Mass., manufacturers of Crucible Sheet Steel Saws and Machine Knives.

HUNTER ARMS COMPANY, Fulton, N. Y., manufacturers of the L. C. Smith Shotguns.

THE BOEBINGER HARDWARE COMPANY, Cincinnati, Ohio, jobbers of Hardware, Mill, Machine Shop and Factory Supplies, &c.

C. H. CASEY, Jordan, Minn., dealer in Hardware, Agricultural Implements, &c.

AMERICAN TOOL CHEST COMPANY, 200 West Houston street, New York, manufacturers of Tool Chests.

SANDAGE STEEL SKEIN COMPANY, South Bend, Ind., manufacturers of Cast Skeins and Wagon Castings.

E. C. ATKINS & Co., Indianapolis, Ind., manufacturers of Saws: A beautiful calendar consisting of leaves daintily tied together with ribbon, embellished with splendidly executed colored reproductions of favorite flowers.

JOHN W. S. PIERSON & Co., Stanton, Mich.: Diary for 1902, presented to their customers on the occasion of their twenty-fifth anniversary, which was celebrated a short time since.

J. A. DUBUAR MFG. COMPANY, Northville, Mich., manufacturers of the Warren Air Rifles.

TAYLOR HARDWARE COMPANY, Allegheny, Pa., brief mention of whose memorandum book was made in our issue 26th ult., advise us that they have been swamped with inquiries for it, and that the supply has been entirely exhausted. The book, indeed, was intended only for their local customers.

BRODERICK & BASCOM ROPE COMPANY, St. Louis, Mo., manufacturers of Wire Rope and Cordage: A beautiful bas relief, the subject of which is "Love's Dream."

## TRADE ITEMS.

ON January 1, Henry M. Gay, one of the oldest Hardware travelers in the Northwest, retired from the road, after having traveled for 35 years in Wisconsin and adjoining territory. Mr. Gay has accepted an inside position with the William Frankfurth Hardware Company of Milwaukee. He began his work as traveling agent in 1867, when he represented the old firm of K. & A. G. Sexton. After five years in the service of this firm he entered the employ of the Biddle Hardware Company of Philadelphia, in which he continued for 14 years. He was subsequently employed by the Woodrough & Hanchett Company of Chicago, and the Simmons Hardware Company of St. Louis. For the past four years Mr. Gay has been with the William Frankfurth Hardware Company.

ANDREWS WIRE & IRON WORKS, Rockford, Ill., tendered a banquet and dance to their employees on Christmas eve. Every one on the payroll, with his wife, if he had one, and children, if blessed with them, was present, and the occasion was one which will long be remembered.

BEGINNING at 10 o'clock on Tuesday and Wednesday mornings, January 14 and 15, E. Bissell & Co., wholesale auctioneers, will conduct a trade sale of 10,000 to 12,000 cases of enameled ware seconds. The sale will be held at 12 Murray street and 15 Park place by order of the National Enameling & Stamping Company and Lalance & Grosjean Mfg. Company. The assortment to be sold will be very large and staple, and will consist of Blue and White, Venetian White and White Regal, Pearl Agate, Peerless and Gray Steel enameled ware seconds.

ALLERTON-CLARKE COMPANY, 97 Chambers street, New York, have recently been made the general selling agents for E. T. Fraim, proprietor of the Keystone Lock Works, Lancaster, Pa., who recently bought out the Union Lock & Hardware Company, also of Lancaster. Mr. Fraim will continue to manufacture the same lines of Padlocks formerly made by the Union Lock & Hardware Company, whose production included fine Bronze and Iron Padlocks, Bicycle and Jail Locks, &c.

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## THE UNITED STATES COMPANY.

A CORPORATION for manufacturing and jobbing Hardware has been organized in New York under the style of the United States Company, with a capital stock of $50,000. The incorporators and officers are as follows: Fred. H. Cozzens, president; Horace C. Hutchins, vice-president and treasurer, and R. W. Hall, secretary. Mr. Cozzens, the president, was secretary of the National Retail Hardware Dealers' Association in 1900, and in that capacity was brought into personal contact with many of the retail dealers of the Middle West, and his attention thus directed to the troublesome competition these merchants were compelled to meet in the catalogue houses and department and racket stores, who buying in most cases directly from the manufacturers at about jobbers' prices, were enabled to resell to the consumer at prices little above what the ordinary retail dealer was compelled to pay his jobber. This condition of things suggested to Mr. Cozzens the importance of some plan whereby the retail dealer would be enabled to meet this competition, and with this end in view he decided to undertake the inauguration of a plan, the object of which would be to place goods in the retailer's hands at figures which would enable him to meet such competition. To accomplish this end the United States Company have been organized. Warehouses will be maintained in Chicago and New York, where the necessary stock will be carried. H. C. Hutchins, vice-president, will have charge of the sales department, having had, we are advised, an extensive experience in dealing with the retail trade, and thus well qualified for this department. The company intend to do a strictly cash business, and expect to be able to handle goods at a much smaller margin of profit than is possible under ordinary conditions. Their sales are to be confined exclusively to the legitimate Hardware trade. The company allude to having completed arrangements for all necessary capital, and enter the Hardware field in the confidence that they are in a position to serve the retail trade advantageously. The address of the company is Park Row Building, New York.

## THE PLANTERS' HOE COMPANY.

THE PLANTERS' HOE COMPANY, Troy, N. Y., announce, under date 6th inst., that they have purchased the factory, trade-marks, good will, &c., of Lane & Gale, who have been well known to the trade for the past 35 years as manufacturers of Lane's Crescent cast steel Eye Hoes. In addition to the exclusive manufacture of Lane's Hoes, they will furnish upon application quotations on all kinds of special patterns of Hoes which may be furnished, including those of English, South American and Mexican patterns. The company are re-equipping the Lane & Gale factory with new machinery, and will thus not only be able to produce a Hoe of extra high polish and finished forging, but also to adhere carefully to the shape and style of the samples furnished. They will also give particular attention, in the manufacture of Hoes, to shape, formation of bead, lightness and strength.

## PRICE-LISTS, CATALOGUES, &c.

BATEMAN MFG. COMPANY, Grenloch, N. J.: Catalogue illustrating and describing their extensive line of the "Iron Age" Farm and Garden Implements. In their introductory they remark that the season just ended has been an exceedingly busy one for them, a greater number of their Tools and Implements having gone from their factories than during any previous year, while a much wider scope of territory has become acquainted with their products.

INDIANAPOLIS BRUSH & BROOM MFG. COMPANY, Indianapolis, Ind.: Folder describing their Capital Metal Case Broom, in which rattan is combined with the corn. Another folder is devoted to their Brush department, where they are in a position to turn out anything to order in this line.

S. W. SMITH, successor to Stoutenberg Mfg. Company, Keithsburg, Ill.: Folder relating to the Cannon Oiler. This Oiler is formed from an ordinary Oil Can with force pump attachment and long spout. A slight pressure of the plunger permits a drop only to escape from the spout, while greater pressure will produce any amount desired, or throw a stream. This feature is referred to as specially serviceable in the use of thick and sluggish oil, as it can be easily forced out. The oiler may be held in an inverted position without the loss of a drop of oil, and overhead machinery may be oiled without tilting the oiler.

BARBOUR-STOCKWELL COMPANY, Cambridgeport, Mass.: Quick Action Vises. Chandler & Washburn patent quick action vises illustrated with prices in the catalogue are designed for the use of pattern makers, piano and organ makers, cabinet makers and wood workers in general. The Vises are made in five sizes.

JOHN R. KEIM, Buffalo, N. Y.: Catalogue and price-list of Bicycle Parts and folder showing some of his Automobile Parts and Supplies for Steam Wagons. Mr. Keim advises us that at the present time his best efforts are being devoted to specialties in brass, copper, iron and steel, which include the product of stamping and drawing presses and modern Screw machine facilities. He is ready to estimate on anything in flat stamping or difficult drawn shapes, the cheapening of intricate pieces now forged or cast, &c. He also does general machine work and makes models for patentees, special Dies, Tools, &c.

THE CHANTRELL TOOL COMPANY, Reading, Pa.: Catalogue No. 12, which in addition to Tools illustrates the line of Hardware upon the manufacture of which they have recently entered. It represents Cupboard and Refrigerator Latches, Cupboard Catches and Turns, Sash Fasteners and Lifts, Drawer Pulls, Spring Hinges, Barrel, Foot and Chain Bolts, Loose Pin and Loose Joint Butts, Frame Pulleys, Sash Chains, Rim Night Latches, &c. Among the Tools shown are Nail Pullers, Screw Drivers, Garden Hoes, Wrought Steel Shelf Brackets, Steel Hatchets and Hammers, Axes, Hat and Coat Hooks, &c.

M. G. RODEARMEL, Boston Block, Minneapolis, Minn.: Pamphlet enumerating the large variety of products made by the different manufacturers for whom he is agent.

THE JOHNSTON HARVESTER COMPANY, Batavia, N. Y.: Catalogue illustrating their line of Binders, Headers, Reapers, Mowers, Rakes, Tedders, Disk Harrows and Cultivators, &c.

AMERICAN RAILWAY SUPPLY COMPANY, 14 Park place, New York: An interesting little pamphlet entitled "Time Checks and Their Use." The company refer to the notable increase in the sales of their Time Checks during the past two years.

N. R. DAVIS & SONS, Assonet, Mass.: Pamphlet showing their Davis Hammer and Hammerless Guns.

PHILLIPS & BUTTORFF MFG. COMPANY, Nashville, Tenn.: Catalogue No. 120, 143 pages, which, besides a large line of Stoves, Ranges, &c., also illustrates a line of Lawn Settees, Vases and Urns, all iron. In placing this latter line on the market they state that care has been taken to select only the most desirable patterns, and that they have been made as light weight as consistent with proper service and durability.

### Elk Bicycles, 1902 Models.

Allerton-Clarke Company, 97 Chambers street, New York, this year will make but one grade of Elk bicycle, in two models, for men and women, listing $40 each. A feature of the wheel will be a one-piece crank, removable without taking out the ball cup by taking off the lock nut and adjusting cone, which permits the crank to be turned through the shell. In the hubs is used a knock out device that permits the removal of either the front or rear wheel without disturbing the adjustment of the bearings or springing the fork sides. To remove the wheel the axle nut is taken off, which allows of sliding the axle out of the hub and the wheel out of the frame, making it a very simple operation to remove the wheel in the event of a puncture and obviating the necessity of readjustment when replacing the wheel. This device also avoids the danger of springing the front forks in forcing them over the end of the axle. A special design of head set is used which makes the

head flush and gives it a fine appearance and finish. The fork crown has been remodeled and a three-plate specially designed crown has been adopted for the 1902 model. The frame has been remodeled and improved, giving it a very natty appearance. The fork sides are tapered and graceful, although strength has not been sacrificed, they being of cold drawn seamless tubing, the gauge tapering from 18 at the top to 16 below. The wheel has also been improved by shortening the rear frame and using a special design of rear stays and a rear fork that is oval from hanger to tip, making a very stiff frame, and, it is claimed, insuring a fast wheel and an easy hill climber. The chain is 3-16 inch polished and nickeled steel, the sides being chamfered to prevent climbing. Every cup and cone is warranted by the manufacturers turned from the solid steel bar (Sanderson's tool steel) and carefully tempered. Special attention is drawn to the finish and equipment. In the men's model the frames are 20, 22 and 24 inch; color, black with orange head or plain black; rims, V shaped, enameled black, with orange center; tires, Hartford 1⅜; pedals, rat trap; handle bars, plain reversible, Kelley or Hussey extension, adjustable; sprockets, 22 to 28 teeth front and 7 to 10 teeth rear.

## The Smith & Egge Automatic Sewing Machine.

The accompanying cut represents a hand sewing machine put on the market by the Smith & Egge Mfg. Company, Bridgeport, Conn., Barnett Bros., Seventy-fourth street and Columbus avenue, New York, sales agents. It is explained that this machine is different from anything that has heretofore been offered to the public. For use, it is fastened in position by a small clamp which goes with the machine. It is a single thread machine, and makes the same kind of stitch, equally as good, it is stated, as any other single thread machine. It has an automatic tension and sews through thick or thin material without any change of tension. It is not designed to take the place of a full sized foot power sewing machine, but many times where it is inconvenient to use a large machine, or in cases where persons are not fortunate enough to have one, it will be

*The Smith & Egge Automatic Sewing Machine.*

found exceedingly useful. Each machine with a clamp and full directions is packed in a neat wooden box, weighing when packed a little over 2 pounds.

## Ball Bearing Casters.

The Smith & Hemenway Company, 296 Broadway, New York, have just taken over the marketing of the entire product of the Acme Ball Bearing Caster Company, formerly of New York, but now of Chappaqua, N. Y., some of the 1902 models of which are here shown. It is believed the new construction eliminates any possible objectionable features developed in the earlier manufactures of the company. The casters as now made have a forged tool steel hardened disk or dome as a race for the balls. Around the periphery of the ball race is a space not sufficiently large to admit a ball, but so graduated that particles from an imperfect or crushed ball can be readily thrown out by the action of the perfect balls. Another new feature is in lacquering

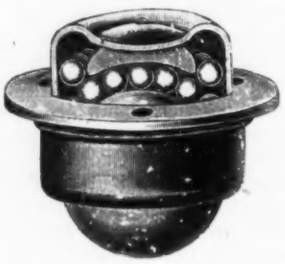


*Fig. 1.—Ball Bearing Plate Caster, with Part of Casing Cut Away.*

and baking the inside shell so that rust does not form, there being no inner contact with the surface ball other than with the small bearing balls and the lower edge of the shell, very slightly. The stems are now so made that they are twice as strong as formerly. The surface balls are made both hollow (that is, of sheet steel) and of solid cast steel, both of which are hardened and tempered. The finishes are brass, nickel plate and antique copper. The company are also manufacturing a number of casters embodying the same principles,

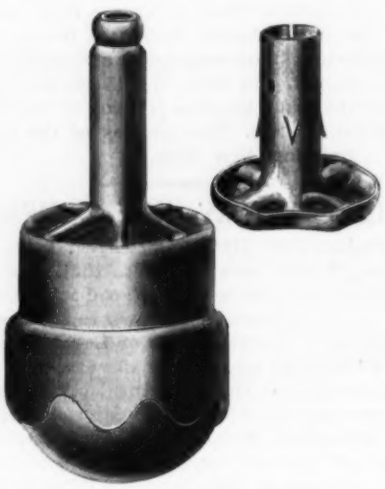


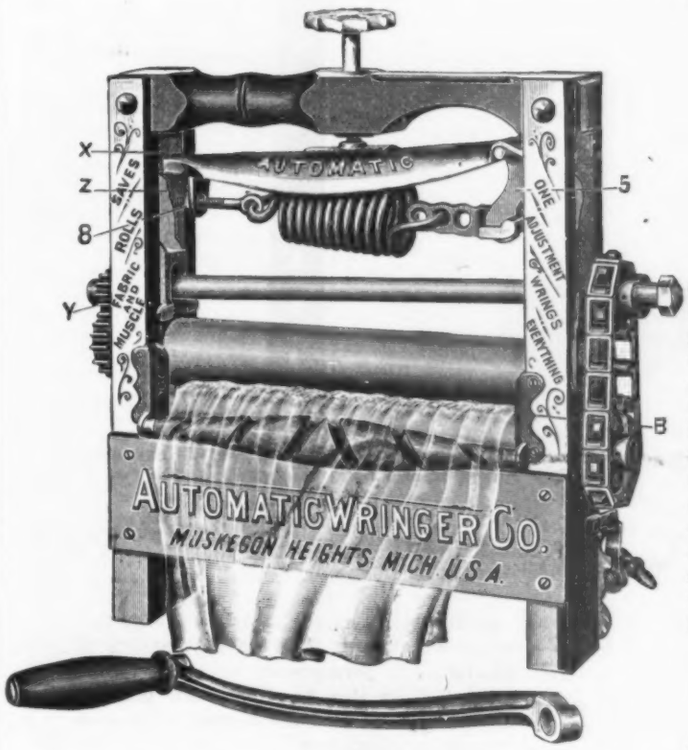
*Fig. 2.—Ball Bearing Caster with Stem.*

but which are not here illustrated. One style is oblong with 1 and 1⅛ inch balls. Another is for brass bedsteads, with 1⅛ and 1¼ inch balls and 1½ and 2 inch bed posts. Still another style is a solid brass caster with ½-inch surface ball for money drawers in safes, cashiers' desks and similar money receptacles that are taken from a vault or safe and pushed about on a desk or table. They also have in process of manufacture a caster on these lines for refrigerators, pianos, buffets, wardrobes, and similar heavy articles, with 1½-inch ball, which will be five times as strong as the hollow ball.

## The Automatic Wringer.

The Automatic wringer, herewith illustrated, is manufactured by the Automatic Wringer Company, Muskegon Heights, Mich. The wringer is so constructed that the full width of the rolls is utilized in wringing clothes, and the pressure at all times is equalized. It is explained that without changing the adjustment the wringer can be used with equal efficiency on a handkerchief or a bed quilt, the adjustment being perfectly automatic. The capacity without changing the wheel

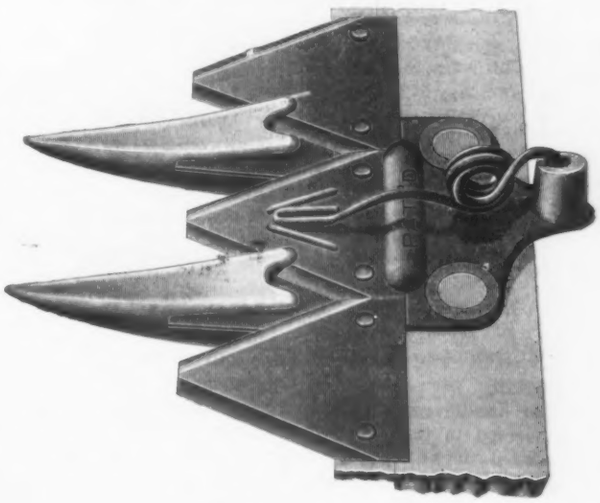
screw, indicated by letters X Z, is claimed to be four times that of ordinary wringers, and if necessary can be increased indefinitely. The roll pressure is equalized by a horizontal coiled spring, which has a compound lever on one side, indicated by the figure 5, and a spring tension readjustment on the other side, accomplished by an eye bolt nut, indicated by the figure 8. This equalization of pressure is claimed to save 50 per cent. in labor. The chain gear, shown by the letter B, does away, it is stated, with side friction, and gives perfect freedom of movement to the rolls, which cannot run out of the gear, shown at Y, thereby effecting a great saving of rolls, fabric and labor. An original feature is the spreader, which is the double cone shaped piece having channels running from the center, shown just in front of the lower roll. Owing to its peculiar shape, this spreads the clothes evenly along the rolls and thus causes the fabric to feed without friction. The crank handle used with the machine is a dovetailed malleable casting, which, it is remarked, will not break, wabble, wear out or need bushing. The rolls are constructed of solid rubber, vulcanized on a cold rolled steel shaft, and are made of a special grade of rubber to secure elasticity, resiliency and firmness.




*The Automatic Wringer.*

## The Hopkins Spring Cutter Cap.

The Whitman & Barnes Mfg. Company, Akron, Ohio, are offering the spring cutter cap herewith shown. It is made of malleable iron, with a removable coil spring to bear on the top of the knife section, the section having raised places so as to control the action of the spring. The cap is referred to as a knife clip which positively lessens the draft of mowing machines, causing the cutting apparatus—sections and guards—to retain their original cutting qualities longer and more effectively. The cap takes the place of the present cutter bar cap or knife clip. It is explained that the cap spring constantly bearing on top of the knife section, holding it in close contact with the guard plate, causes a positive shear cut, the same action as a pair of new scissors. Because the knife sections are constantly held to bear on the guard plates, it is shown that the cutting edges of both sections and plates retain their original sharpness, making practically a self sharpening device. The cutter cap also controls the throw of the pitman at the end of the strokes, thus, it is pointed out, lessening the strain and pound on the crank pin and knife head, which reduces friction and prevents breakage. The cap is alluded to as positively non-clogging, the motion of the spring—which moves with the knife—throwing the cut grass to either side. The action of the spring, it is stated, lessens the draft of the mower, as the spring does not have a rigid bearing on the knife, but swings on a pivot and yields to every motion of the bar in going over rough and uneven ground. The manufacturers remark that tests made during the past hay harvest showed that machines equipped with this cap will cut over a larger area without regrinding knives, thereby saving time and expense. It is further remarked that it has been demonstrated by actual dynamometer tests that machines equipped with these caps average over 30 per cent. lighter draft when applied to new machines and over 50 per cent. when applied to old machines. The cap can be substituted for the ordinary caps on any of the leading mowers now on the market. They are furnished in sets of four, five and six each, for 4½, 5, 6 and 7 foot cutter bars.



*The Hopkins Spring Cutter Cap.*

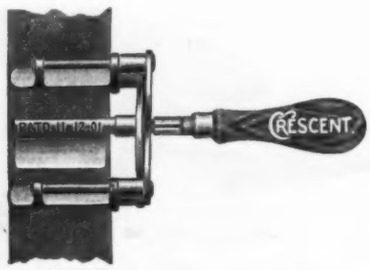
## The Derby Twentieth Century Can Opener.

The W. H. Plumb Novelty Company, Ansonia, Conn., are offering the can opener herewith shown. In use, after pushing the point of the opener through the center of the can, the knife is slid along on the bar to the required distance from the point to cut the desired opening in the can. It is then locked in place by pushing down the small lever. The opener is referred to as being made of tool steel, tempered, and as being durable. It is explained that it is easily adjusted, that it will open any sized can, large or small, cutting out the top smoothly, and that no rough edge is left to cut the hands.

*The Derby Twentieth Century Can Opener.*

## Crescent Safety Razor Stropper.

The Southington Cutlery Company, Southington, Conn., and 98 Chambers street, New York, have just put out the Crescent safety razor stropper, here illustrated one-third size. This device is for stropping their

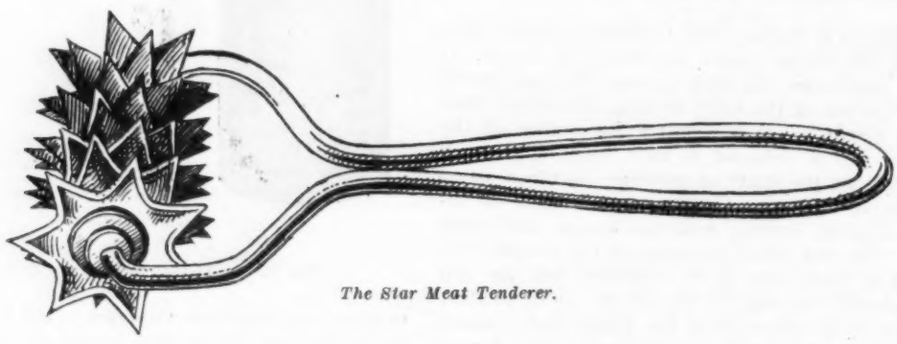



*Crescent Safety Razor Stropper.*

Crescent safety razor, recently put on the market. The metallic portion of the stropper is nickeled brass and the handle rosewood. In operation the razor blade is inserted in the spring holder, the stropper being then moved backward and forward over the surface of a swing strop, when the frictional pressure alternately on one side and then on the other revolves the blade a half turn in each direction, turning the blade on its back and stropping the edge. This action is made possible by means of a thin flat steel spring which controls the supports as they press against the strop. The stropper is jointed at the shank, so that when not in use it can be separated into two parts for more compact packing, each stropper being put up in a neat double pasteboard box, the extreme dimensions of which are 4 x 2¾ x 1¼ inches, with an abundance of room to hold the razor also if necessary.

## The Star Meat Tenderer.

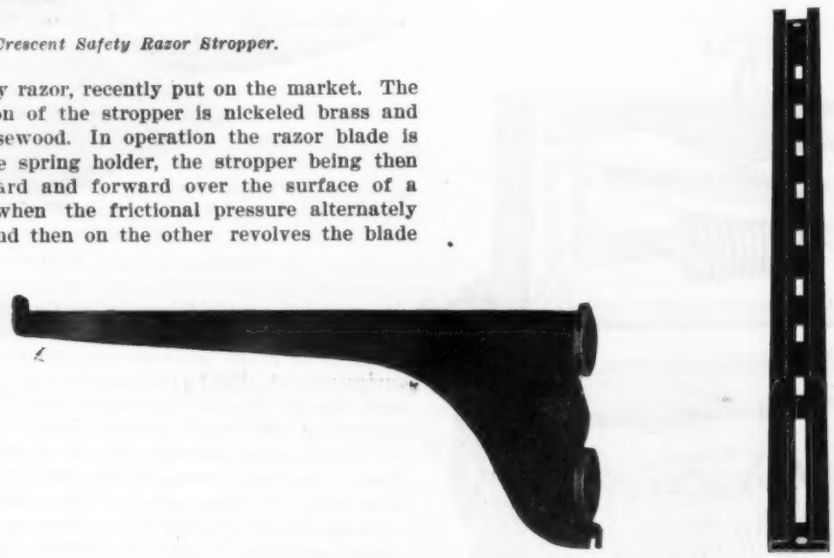
The accompanying illustration represents a meat tenderer offered by the Parker Wire Goods Company, Worcester, Mass. The tenderer consists of eight seven-pointed stars, stamped from sheet steel. These are fastened rigidly on a cylinder, with washers between each star. Each point of the stars has its edges dished outwardly from the cylinder. When it is necessary to sharpen, a small flat file may be drawn to and fro against the outward edge of each star, bringing them to a keen cutting edge. In running the tenderer over the meat the cylinder turns, carrying all the stars with it. The manufacturers state that when thoroughly used it never fails to render otherwise tough meat very tender, more palatable and easily masticated, by cutting and separating the fibrous tissues and tendons, which causes toughness in ordinary meats. It is further explained that although highly successful in all cases, the tenderer is especially so with round and rump steaks. The device is designed to retail at 25 cents.



*The Star Meat Tenderer.*

## The Wisconsin Adjustable Bracket.

The Wisconsin Iron & Wire Works, 186 to 190 East Water street, Milwaukee, Wis., have just added an adjustable bracket to their line of hardware specialties, which is herewith illustrated. The bracket consists of two parts. The slide is permanently attached to the wall, and the bracket can then be slipped into place at the bottom and pushed up until the desired position is reached, when the projection at the bottom of the bracket will slip into a hole in the slide and be firmly retained in position. The bracket is made in lengths of 8 to 18 inches, and finished in enamel, nickel or copper plate.



*The Wisconsin Adjustable Bracket.*

Luttrell Hardware Company, Brewton, Ala., in the near future will move into a new store, which will have double the space of the one at present occupied. They will then be able to carry a more extensive assortment of goods, and also anticipate adding several new lines of goods. Their stock now comprises Carpenters' and Builders' Supplies, Farming Implements, Log Cart Materials, Saw Mill Supplies, Sporting Goods and General Hardware.

# Current Hardware Prices.

## REVISED JANUARY 7, 1902.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent discount.

**Cut Prices.**—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

### Adjusters Blind—

Domestic, ₩ doz. $3.00...33⅓@33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

### Window Stop—

Ives' Patent.....25&5%
Taplin's Perfection.....50%

### Ammunition—See *Caps, Cartridges, Shells, &c.*

### Anvils—American—

Arm and Hammer, Wrought ₩ lb 8½@8¾¢
Buel Patent Trenton.....₩ lb 9½@9¾¢
Eagle Anvils.....₩ lb 7¾@7¾¢
Hay-Budden, Wrought.....9@9½¢
Horseshoe brand, Wrought.....9@9½¢

### Imported—

Peter Wright's.....9¼@9¼¢

### Anvil, Vise and Drill—

Millers Falls Co., $18.00.....20%

### Apple Parers—See *Parers, Apple, &c.*

### Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz.....25%
Smaller Lots.....20%
Lots of 3 doz.....30%

### Augers and Bits—

*Com. Double Spur.....70@70&10%*
*Boring Machine Augers.....60&10&10@70&10%*
*Car Bits, 12-in. twist.....60@60&10%*
*Jennings' Pattern Auger Bits.....50&10&5@60%*
Ford's Auger and Car Bits.....40&10%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list....40%
No. 30, R. Jennings' List.....50%
Russell Jennings'.....25&10&5%
L'Hommedieu Car Bits 15&10@15&10&5%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50&10%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (R. Jennings' list).....50%

### Bit Stock Drills—

*Standard List.....65@65&5%*

### Expansive Bits—

Clark's small, $1.5; large, $2.6.....50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $36; No. 2, $18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33⅓%
Swan's.....6%

### Gimlet Bits—

*Common Double Cut..gro. $2.25@2.75*
*German Pattern.....gro. $3.25@4.50*

### Hollow Augers—

*Bonney Pattern, per doz. $11.00@11.50*
Ames.....25&10%
New Patent.....25&10%
Universal.....30%
Wood's Universal.....25%

### Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....40%

### Awl Hafts, See *Hafts, Awl.*

### Awls—

*Brad Awls:*
*Handled.....gro. $1.75@3.10*
*Unhandled, Shouldered..gro.63@66c*
*Unhandled, Patent.....gro. 66@70c*
*Peg Awls:*
*Unhandled, Patent.....gro. 51@54c*
*Unhandled, Shouldered..gro.65@70c*
*Scratch Awls:*
*Handled, Common..gro. $3.50@4.00*
*Hand'ed, Socket..gro. $11.50@12.00*

### Awl and Tool Sets—See *Sets, Awl and Tool.*

### Axes—

*First Quality, best brands.$5.50@6.75*
*First Quality, other brands.$5.25@5.50*
*Jobbers' Special Brands:*
*Good Quality.....$4.50@4.75*
*Best Quality.....$5.00@5.25*
*Cheap, Handled Axes.....$5.50@5.75*
*Beveled, add 25c doz.*

### Axle Grease—See *Grease, Axle.*

### Axles—

*Iron or Steel.*
*Concord, Loose Collar....4½@5c*
*Concord, Solid Collar....4¾@5¼c*
*No. 1 Common.....3¼@3¾c*
*No. 1½ Com. New Style..3¼@4 c*
*No. 2, Solid Collar.....4¼@4½c*
*Nos. 11 to 14.....70@70&10%*
*Nos. 15 to 18.....75@75&10%*
*Nos. 19 to 22.....75@75&10%*

*2% cash 10 days.*

### Boxes, Axle—

*Common and Concord, not turned..lb. 4½@4½c*
*Common and Concord, turned.....lb. 4¾@5c*
*Half Patent.....lb. 8@9c*

### Balances—

Caldwell new list.....50%
Pullman's.....60%

### Sash—

### Spring—

*Spring Balances....50&10@50&10&5%*
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....80%
Pelouze.....50%

### Barb Wire—See *Wire, Barb.*

### Bars—

### Crow—

*Steel Crowbars, 10 to 40 lb., per lb..2¾@3c*

### Beams, Scale—

*Scale Beams, List Jan. 12, '92.40&10%*
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

### Beaters—

### Egg—

| | ₩ gro. |
|---|---|
| Standard Co.: | |
| No. 0 Rapid | $4.50 |
| No. 10 Dover Family Size | 6.50 |
| No. 15 Dover Hotel Size | 12.00 |
| Rival | 9.00 |
| **Taplin Mfg. Co.:** | **₩ gro.** |
| No. 60 Improved Dover | 6.50 |
| No. 75 Improved Dover | 7.50 |
| No. 75-2 Imp'd Dover, Tin'd | 9.00 |
| No. 100 Improved Dover | 8.00 |
| No. 102 Improved Dover, Tin'd | 9.50 |
| No. 150 Improved Dover, Hotel | 15.00 |
| No. 152 Imp'd Dover, Hotel, T'd | 17.00 |
| Lyon's, Standard size | ₩ doz. $1.75 |
| Wonder (S. S. & Co.) | ₩ gro. $7.50 |

### Bellows—

*Blacksmith, Standard List.70@70&10%*
C. E. Jennings & Co., Blacksmith..60&10%
C. E. Jennings & Co., Hand.....33⅓%

### Blacksmiths—

| *Inch..* | *9* | *10* | *11* | *12* | *14* | *16* |
|---|---|---|---|---|---|---|
| *Each..* | *$3.50* | *3.75* | *4.25* | *4.80* | *5.35* | *6.15* |

*Extra Length:*
*Each..$4.00 4.55 5.10 5.60 6.40 7.50*

### Molders—

| *Inch..* | *6* | *7* | *8* | *9* | *10* | *12* |
|---|---|---|---|---|---|---|
| *Doz..* | *$6.75* | *7.25* | *8.50* | *9.50* | *12.00* | *14.50* |

### Hand—

| *Inch...* | *6* | *7* | *8* | *9* | *10* | *12* |
|---|---|---|---|---|---|---|
| *Doz...* | *$3.75* | *4.25* | *4.50* | *5.00* | *5.7* | *6.75* |

*Net Prices.*

### Bells—

### Cow—

*Ordinary goods.....75&5@75&10%*
*High grade.....70@70&10%*
Jersey.....75&10%
Texas Star.....50%

### Door—

Abbe's Gong.....45%
Barton Gong.....55%
Home, E. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's.....40@40&10%
Yankee Gong.....55%

### Hand—

*Hand Bells, Polished.....60&5@66⅔%*
*White Metal.....55@55&10%*
*Nickel Plated.....30@50&10%*
Swiss.....60@60&7½%
Silver Chime.....33⅓@33⅓&10%

### Miscellaneous—

*Farm Bells.....lb. 2@2½c*
*Steel Alloy Church and School.....50&10&5@50%*
National Bell Foundry Co.:
Superior Cast Steel Church and School Bells.....50&10&5@60%
Wilmot & Hobbs Mfg. Co., Gongs.....70%

### Belting—Rubber—

*Agricultural (Low Grade).75&10@30%*
*Common Standard.....75@75&10%*
*Standard.....70@70&10%*
*Extra.....60&10&5%*
*High Grade.....55&10@50&10&5%*
Boston Belting Co.:
Seamless Stitched, Imperial.....45&5%
Boston.....50&5%
Niagara.....60&5%

### Leather—

*Extra Heavy, Short Lap...50&10@60%*
*Regular Short Lap.....60@60&5%*
*Standard.....60&10@65&10%*
*Light Standard.....65@70%*
*Leather Lacing.....60&10%*

### Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand.....60&10%
Durable Brand.....70%

### Bench Stops—See *Stops, Bench*

### Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....40@50%

### Bicycle Goods—

John S. Long's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

### Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

### Bit Holders—See *Holders.*

### Blind Adjusters—See *Adjusters, Blind.*

### Blind Fasteners—See *Fasteners, Blind.*

### Blind Staples—See *Staples, Blind.*

### Blocks—

### Tackle—

*Common Wooden.....70&10@75%*
Cleveland's Steel.....60&10&10%
Hollow Steel, Ford's Pat. Star Brand.....60&10%
Lane's Patent Automatic Lock and Junior.....50&10%
Stowell's Novelty, Mal. Iron.....80%
Stowell's Novelty, Mal. Iron.....50&10%
See also *Machines, Hoisting.*

### Boards Stove—

*Zinc, Crystal, &c.....40&10@...%*

### Bolts—

### Carriage, Machine &c.—

*Common, list Jan. 30, '95..65&2½@...%*
*Norway Iron, $3.00, list Oct. 7, '94..80@80&5%*
*Phila. Eagle, $3.00 list May 24, '99....80@80&10%*
*Bolt Ends, list Jan. 30, '95...70&5@...%*
*Machine, list Oct. 1, '99.....70&3½@...%*
*Machine with C. & T. Nuts.....65&7½@...%*

NOTE—*The rapid advances in manufacturers' prices enable the jobbers to cut prices freely.*

### Door and Shutter—

*Cast Iron Barrel, Round Brass Knob:*

| *Inch.....* | *3* | *4* | *5* | *6* | *8* |
|---|---|---|---|---|---|
| *Per doz...* | *$0.26* | *.30* | *.39* | *.47* | *.85* |

*Cast Iron Spring Foot:*

| *Inch.....* | *6* | *8* | *10* |
|---|---|---|---|
| *Per doz.....* | *$1.00* | *1.35* | *1.75* |

*Cast Iron Chain, Flat, Japanned:*

| *Inch.....* | *6* | *8* | *10* |
|---|---|---|---|
| *Per doz.....* | *$0.75* | *1.05* | *1.30* |

*Cast Iron Shutter, Brass Knobs:*

| *Inch.....* | *6* | *8* | *10* |
|---|---|---|---|
| *Per doz.....* | *$0.57* | *.80* | *1.00* |

*Wrought Barrel Brass Knob:*

| *Inch.....* | *3* | *4* | *5* | *6* | *8* |
|---|---|---|---|---|---|
| *Per doz...* | *$0.44* | *.50* | *.51* | *.70* | *1.28* |

*Wrought Barrel.....70&10@75&5%*
*Wrought "D" Bronzed.50&5@50&10%*
*Wrought Flush, B. K..50&10@60&10%*
*Wrought Shutter...50&10&10@60&5%*
*Wrought Square Neck.....50@50&10%*
*Wrought Sunk.....50@50&10%*
Ives' Patent Door.....60%

### Stove and Plow—

*Plow.....60&5@...%*
*Stove.....77½%*

### Tire—

*Common.....77½%*
*Norway Iron.....50@50&5%*
American Screw Company:
Norway Phila., list Oct. 16, '94....82½%
Eagle Phila., list Oct. 16, '94.....85%
Bay State, list Dec. 28, '99.....77½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '94..82½%
Eagle Phila., list Oct. 16, '94.....85%
Eclipse, list Dec. 28, '99.....77½%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99.....77½%
Keystone Phila. list Oct. '94.....85%
Norway Phila., list Oct. '94.....82½%
Upson Nut Co.:
Tire Bolts.....77½%

### Borers, Tap—

*Borers Tap, Ring, with Handle:*

| *Inch.....* | *1¼* | *1½* | *1¾* | *2* |
|---|---|---|---|---|
| *Per doz...* | *$4.30* | *5.00* | *5.75* | *7.25* |
| *Inch.....* | | | *2¼* | *2½* |
| *Per Doz.....* | | | *$8.65* | *11.50* |

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

### Boring Machines—See *Machines, Boring.*

### Boxes, Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., $30.....40%

### Braces—

NOTE.—*Most Braces are sold at net prices.*
*Common Ball, American..$1.15@1.25*
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....60%
C. E. Jennings & Co.....50&10%
Mayhew's Ratchet.....50%
Mayhew's Quick Action Hay Patent..50%
P., S. & W. Co Peck's Patent.....60&10@65&5%

### Brackets—

*Wrought Steel.....75&5@75&10%*
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%
Griffin's Pressed Steel.....75%
Griffin's Folding Brackets.....70&10%

### Bright Wire Goods—See *Wire and Wire Goods.*

### Broilers—

Wire Goods Co.....75%

### Buckets, Well and Fire—See *Pails*

### Bucks, Saw—

Boss.....₩ gro. $48.00
Hoosier.....₩ gro. $36.00

### Bull Rings—See *Rings, Bull.*

### Butts—

### Brass—

*Wrought list Sept., '99.....40@40&5%*
Cast Brass, Tiebout's.....50%

### Cast Iron—

*Fast Joint, Broad.....50@50&10%*
*Fast Joint, Narrow.....50@50&10%*
*Loose Joint.....70&5@70&10%*
*Loose Pin.....70&5@70&10%*
*Mayer's Hinges.....70&5@70&10%*
*Parliament Butts.....70&5@70&10%*

### Wrought Steel—

*Table and Back Flaps.....60%*
*Narrow and Broad.....60%*
*Inside Blind.....66&10%*
*Loose Pin.....60&10%*
*Loose Pin, Ball and Steeple Tip.....75%*
*Japanned, Ball Tip Butts...60%*
*Bronzed Wrt. Nar. and Inside Blind Butts.....45&20@45&25%*

*Extra 25%*

### Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

### Calipers—See *Compasses,*

### Calks, Toe and Heel—

*Blunt, 1 prong.....per lb..3¼@4c*
*Sharp, 1 prong.....per lb....5@5½c*
Perkins' Blunt Toe.....₩ lb 3½c
Perkins' Sharp Toe.....₩ lb 4 ¢

### Can Openers—See *Openers, Can*

### Cans, Milk—

| | 5 | 8 | 10 gal. | |
|---|---|---|---|---|
| Illinois Pattern. | $1 75 | 2.10 | 2.35 | each. |
| Iowa Pattern... | .... | 2.40 | 2.60 | each. |
| Buffalo Pattern. | .... | 2.30 | 2.50 | each. |
| | 20 | 30 | 40 | qts. |
| New York Patt'rn | 3.00 | 3.25 | 3.40 | each. |
| Baltimore Patt'rn | 2.50 | 2.85 | 3.10 | each. |

### Cans, Oil—

Buffalo Family Oil Cans:

| 3 | 5 | 10 gal. |
|---|---|---|
| $48.00 | 60.00 | 108 gro |

### Caps—Percussion—

*Eley's E. B.....80c*
*G. D.....per M $3@3.10*
*F. L.....per M $7@7.10*
*G. E.....per M $7@7.10*
*Musket.....per M $7@8.00*

### Primers—

*Berdan Primers, $1.00.....5%*
*B. L Caps (Sturtevant Shells) $1.00.....5%*
*All other primers.....$1.10@$1 15*

### Carpet Stretchers—See *Stretchers, Carpet.*

### Cartridges—

*Blank Cartridges:*
*38 C. F., $5.50* ..... 10&5@10&10%
*38 C. F., $7 00* ..... 10&5@10&10%
*22 cal. Rim, $1.50* ..... 10&5@10&10%
*32 cal. Rim, $2.75* ..... 10&5@10&10%
*B. B. Caps, Con., Ball Smgd. $1 80@1.85*
*B. B. Caps, Round Ball... $1.10@1.15*
*Central Fire* ..... 25@25&5%
*Pistol and Rifle* ..... 15&5@15&10%
*Primed Shells and Bullets* .....
15&5@15&10%
*Rim Fire Sporting* ..... 50@50&5%
*Rim Fire, Military* ..... 15&5@15&10%

### Casters—

*Bed* ..... 70&10@70&10&5%
*Plate* ..... 75&10@75&10&5%
*Philadelphia* ..... 75&10@75&10&5%
Boss ..... 70&10%
Boss Anti-Friction ..... 70&10%
Martin's Patent (Phœnix) ..... 45%
Payson's Anti-Friction ..... 70&10&10&10%
Standard Ball Bearing ..... 45%
Tucker's Patent, low list ..... 80%

### Cattle Leaders—

See *Leaders. Cattle.*

### Chain, Coil—

*American Coil, Cask lots:*

| 3-16 | ¼ | 5-16 | ⅜ | 7-16 | ½ | 9-16 |
|---|---|---|---|---|---|---|
| 8.00 | 6.00 | 5.00 | 4.25 | 4.10 | 4.00 | 4.05 |

¾ to 1 in. 1¼ to 1¼ inch.
3.85 3.80 3.75 per 100 lb.
*Less than Cask lots add 25c.*
*German Coil, list July 24, '97.60&10@10%*

### Halters and Ties—

*Halter Chains* ..... 60@10%
*German Halter Chain, list July 24, '97* ..... 60@10&10%
*Cow Ties* ..... 60%

### Trace, Wagon, &c.—

*Traces, Western Standard: 100 pair*
*6½—6-3, Straight, with ring.. $30.00*
*6½—6-2, Straight, with ring.. $31.00*
*6½—8-2, Straight, with ring.. $35.00*
*6½—10-2, Straight, with ring..$38.00*
*Add 2¢ per pair for Hooks.*
*Twist Traces 2¢ per pair higher than Straight Link.*
*Trace, Wagon and Fancy Chains..*
50&10@50&10&5%

### Miscellaneous—

*Jack Chain, list July 10, '93:*
*Iron* ..... 60@60&10%
*Brass* ..... 60@60&10%
*Safety Chain* ..... 70&5@70&10%
*Gal. Pump Chain* ..... lb. 4¾&½c
Covert Mfg. Co.:
Breast ..... 35&2%
Halter ..... 35&2%
Heel ..... 35&2%
Rein ..... 35&2%
Stallion ..... 35&2%
Covert Sad. Works:
Breast ..... 70%
Halter ..... 70%
Hold Back ..... 70%
Rein ..... 70%
Oneida Community:
Am. C ll and Halters ..... 40@45&5%
Am. Cow Ties ..... 45@50%
Eureka Coil and Halter ..... 45@50&5%
Niagara Coil and Halter ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%
Wire Dog Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain ..... 60&10%
Universal Dbl-Jointed Chain ..... 50%

### Chalk—(From Jobbers.)

*Carpenters' Blue* ..... gro. 42@45c
*Carpenters', Red* ..... gro. 37@40c
*Carpenters', White* ..... gro. 33@35c
*See also Crayons.*

### Chalk Lines—See *Lines.*

### Checks, Door—

Bardsley's ..... 40&10%
Columbia ..... 50&10%
Eclipse ..... 60@60&10%

### Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools ..... 55%
Youths' Chests, with Tools ..... 40%
Gentlemens' Chests, with Tools ..... 30%
Farmers', Carpenters', etc., Chests, with Tools ..... 20%
Machinists' and Pipe Fitters' Chests, Empty ..... 50%
C. E. Jennings & Co.'s Machinists' Tool Chests ..... 20%

### Chisels—

### Socket Framing and Firmer

*Standard List* ..... 70c&5@70c&10%
Buck Bros ..... 30%
Charles Buck ..... 30%
C. E. Jennings & Co. Socket Firmer No. 10 ..... 60&10%
C. E. Jennings & Co. Socket Framing No. 15 ..... 60&10%
Swan's ..... 70&5%
L. & I. J. White ..... 30@30&5%

### Tanged—

*Tanged Firmers* ..... 40&5@40&10%
Buck Bros ..... 30%
Charles Buck ..... 30%
C. E. Jennings & Co. Nos. 191, 181 ..... 25%
L. & I. J. White, Tanged ..... 25&5%

### Cold—

*Cold Chisels, good quality..lb. 13@15c*
*Cold Chisels, fair quality..lb. 11@12c*
*Cold Chisels, ordinary* ..... *lb. 8@9c*

### Chucks—

Beach Pat., each $8.00 ..... 20%
Massey's Planer and Milling ..... 15@20%
Skinner Patent Chucks:
Combination Lathe Chucks ..... 40%
Drill Chucks, Patent and Standard ..... 30%
Drill Chucks, New Model ..... 2½
Independent Lathe Chucks ..... 40%
Improved Planer Chucks ..... 25%
Universal Lathe Chucks ..... 40%
Face Plate Jaws ..... 40%
Standard Tool Co.:
Improved Drill Chuck ..... 45%
Union Mfg. Co.:
Combination ..... 40%
Czar Drill ..... 30%
Geared Scroll ..... 30%
Independent ..... 40%
Union Drill ..... 30%
Universal ..... 40%
Face Plate Jaws ..... 35%

### Clamps—

Adjustable, Hammers' ..... 20@20&5%
Cabinet, Sargent's ..... 50&10%
Carriage Makers', P., S. & W. Co. 40&10%
Carriage Makers' Sargent's ..... 50&10%
Beaty, Parallel ..... 35¼&10%
Lineman's, Ulica Drop Forge & Tool Co ..... 40%
Saw Clamps, see *Vises, Saw Filers'.*

### Cleaners, Sidewalk—

Star Socket, All Steel ..... ₱ doz. $4.00 net
Star Shank, All Steel ..... ₱ doz. $3.75 net
W. & C. Shank, All steel, 7¼ in. ₱ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

### Cleavers, Butchers'—

Foster Bros ..... 30%
New Haven Edge Tool Co.'s ..... 40%
Fayette R. Plumb ..... 33⅓@33⅓&10%
P., S. & W ..... 50@50&5%
L. & I. J. White ..... 25%

### Clippers—

Chicago Flexible Shaft Company
Handy Toilet ..... ₱ doz. $7.20
Mascotte Toilet ..... ₱ doz. $3.40
Monitor Toilet ..... ₱ doz. $9.00
Stewart's Patent ..... ₱ dos. $10.00

### Clips Axle—

*Eagle and Superior ¼ and 5-16 inch* ..... 70c&10%
*Norway, ½ and 5-16 inch..70@70c&10%*

### Cloth and Netting, Wire —See *Wire, &c.*

### Cocks, Brass—

*Hardware list:*
*Compression and Plain Bibbs, 65c&5%*
*Globe, Kerosene, Racking, &c., Cocks* ..... 65c&10%

### Coffee Mills—See *Mills, Coffee.*

### Collars Dog—

Brass, Pope & Stevens' list ..... 40%
Embossed, Gilt, Pope & Stevens' list 30&10%
Leather Pope & Stevens' list ..... 40%

### Compasses Dividers, &c.

*Ordinary Goods* ..... 75@75c&5%
Bemis & Call Hdw. & Tool Co.:
Dividers ..... 63%
Calipers, Call's Patent Inside ..... 55%
Calipers, Double ..... 65%
Calipers, Inside or Outside ..... 65%
Calipers, Wing ..... 60%
Compasses ..... 50%
J. Stevens A. & T. Co ..... 25&10%

### Compressors Corn Shock—

J. B. Hubbard ₱ doz ..... $2.50

### Conductor Pipe, Galva.—

*L. C. L. to Dealers:*

| Territory. | Not nested. | Nested. |
|---|---|---|
| *Eastern* | 70c&5c&10% | 70c&5c&10% |
| *Central* | 65c&10c&10% | 70c&10% |
| *Southern* | 65c&10% | 65c&2½&c&10% |
| *S. Western* | 60c&12½&c&10% | 60c&15c&10% |

*Terms, 2% for cash.*
*Jobbers receive extra 12½&2½ on carloads loose, and extra 12½ on carloads crated.*
See also *Eave Troughs.*

### Coolers, Water—

| Nos. | 2 | 3 | 4 | 6 |
|---|---|---|---|---|
| Labrador | $11.50 | $14.00 | $17.50 | $20.00 |

8 gal. $23.00

| Nos | 3 | 4 | 6 | 8 |
|---|---|---|---|---|
| Iceland | $23.00 | $25.00 | $30.00 | $37.50 |

10 14 gal. $57.00 $72.00

### Coopers' Tools—

See *Tools, Coopers'.*

### Cord— Sash—

*Braided, Drab* ..... *lb. 25c*
*Braided, White, Common..lb. 17@18c*
*Cable Laid Italian..lb. A, 18c; B, 16c*
*Common India* ..... *lb 9 @9¼c*
*Cotton Sash Cord, Twisted....12@16c*
*Patent Russia* ..... *lb. 12½@13c*
*Cable Laid Russia* ..... *lb. 13½@14c*
*India Hemp, Braided* ..... *lb 14@15c*
*India Hemp, Twisted* ..... *lb. 10@12c*
*Patent India, Twisted* ..... *lb.10@12c*
Pearl Braided, cotton ..... ₱ lb 17½¢
Massachusetts, White ..... ₱ lb 22¢
Massachusetts, Drab ..... ₱ lb 26½¢
Eddystone Braided Cotton ..... ₱ lb 19¢
Harmony Cable Laid Italian ..... ₱ lb 18¢
Ossawan Mills:
Crown, Solid Braided White ..... ₱ lb 22¢
Braided, Giant, White ..... ₱ lb 20¢
Peerless:
Cable Laid Italian ..... 16¢
Cable Laid Russian ..... 14¢
Cable Laid India ..... 12¢
Braided India ..... 18¢
Phœnix, White ..... 19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton ..... ₱ lb 32½¢
Braided, Italian Hemp ..... ₱ lb 32½¢
Braided, Linen ..... ₱ lb 49¢
Braided, White Cotton, Spot ₱ lb 28½¢
No. 6 extra, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢ ..... 15%
A quality, White, 35¢ ..... 15%
B quality, Drab, 35¢ ..... 15%
B quality, White, 30¢ ..... 15%
Italian Hemp, 40¢ ..... 15%
Linen, 57½¢ ..... 15%

### Wire, Picture—

*Braided or Twisted* ..... *85c&10%*
*Note.—There is a good deal of confusion in lists, some using old list and others the new list.*

### Corn Knives and Cutters —See *Knives, Corn.*

### Corn Planters—

See *Planters, Corn.*

### Crackers, Nut—

Little Giant ..... ₱ gr. $24.00

### Cradles—

*Grain* ..... 50%

### Crayons—

*White Round Crayons, gross, 5½@6c*
*Cases, 100 gro., $4.50, at factory.*
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square ..... gr. $1.50
Rolling Mill Crayons ..... gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 20%
See also *Chalk.*

### Creamery Pails—See *Pails, Creamery.*

### Crooks, Shepherds'—

Fort Madison, Heavy ..... ₱ doz. $7.00
Fort Madison, Light ..... ₱ doz. $6.50

### Crow Bars—See *Bars, Crow.*

### Cultivators—

Victor Garden ..... ₱ dos. $16.00

### Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847.. ₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ₱ doz $3.00
Wm. Rogers & Son ..... ₱ doz. $2 50
Simeon L. & Geo H. Rogers Company:
12 dwt Medium Knives ..... ₱ doz. $3.00
No. 77 Medium Knives ..... ₱ doz. $2.50

### Cutters— Glass—

H. H. Mayhew Co ..... 40%
Smith & Hemenway Co ..... 50%

### Meat—

| *Hale's...Nos.* | *11 & 111* | *12 & 112* | *13 & 113* |
|---|---|---|---|
| *Per doz* .. | *$9.50* | *12.50* | *16.00* |

American ..... 30%

| Nos. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Each | $5 | $7 | $10 | $25 | $50 | $80 |

Connecticut ..... 50%

| No. | 20 | 40 | 60 | 8 | 10 | 12 |
|---|---|---|---|---|---|---|
| Each | $1.75 | 2.00 | 2.25 | 3.00 | 3.00 | 4.00 |

Enterprise ..... 25@25&7½%

| Nos. | 5 | 10 | 12 | 22 | 32 |
|---|---|---|---|---|---|
| Each | $2 | $3 | $3.50 | $4 | $6 |

Dixon's, ₱ doz ..... 30&10@40%

| Nos. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | $14.00 | $17.00 | $19.00 | $30.00 |

Home No. 1, ₱ doz. $23.75 ..... 50&10%
Little Giant, ₱ doz ..... 37½&5@40%

| Nos. | 305 | 310 | 312 | 390 | 392 |
|---|---|---|---|---|---|
| | $35.00 | $48.00 | $44.00 | $74.00 | $68.00 |

Sterling ..... 33⅓&5%

| Nos | 1 | 2 |
|---|---|---|
| Each | $5.00 | $3.50 |

New Triumph No. 605, ₱ doz. 324.00 ..... 30&10@40%
Woodruff's, ₱ doz ..... 30&10@40%

| Nos. | 100 | 150 |
|---|---|---|
| | $15.00 | $18.00 |

Chadborn's Smoked Beef Cutter, ₱ doz. $60.00
Enterprise Beef Shavers ..... 25@30%

### Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c ..... 40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12 ..... 40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters ..... 40%
Slaw Cutters, 1 Knife, ₱ gr. ..... $18@$20
Slaw Cutters, 2 Knife, ₱ gr. ..... $22@$36

### Tobacco—

*All Iron, Cheap* ..... *doz. $4.25@$4 50*
Enterprise ..... 25@50%
National, ₱ doz. $21.00 ..... 40%
Sargent's, ₱ doz., No. 2 ..... 45&10%
Sargent's No 12 and 21 ..... 60&10%

### Washer—

Appleton's, ₱ dos. $16.00 ..... 50&10&10%
Bonney's ..... 40%

### Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger.... 40%
Iwan's Perfection Post Hole Digger... ₱ doz. $9.00
Kohler's Universal ..... ₱ doz., $14.00
Kohler's Little Giant ..... ₱ doz. $14.00
Kohler's Hercules ..... ₱ doz. $12.00
Kohler's Invincible ..... ₱ doz. $10 00
Kohler's Rival ..... ₱ doz. $9.00
Kohler's Pioneer ..... ₱ doz. $9.00
Never-Break Post Hole Diggers, ₱ doz. $24.00 ..... 60%
Samson, ₱ doz. $94.00 ..... 25%

### Dividers—See *Compasses.*

### Dog Collars—See *Collars, Dog.*

### Door Checks—

See *Checks, Door.*

### Door Springs—

See *Springs, Door.*

### Doors, Screen—

Porter's Plain, No. 6 ..... ₱ doz. $6 50
Porter's Ornamental, No. 70. ₱ doz. $10.00

### Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18.

### Drawing Knives—

See *Knives, Drawing.*

### Drills and Drill Stocks—

*Common Blacksmiths' Drill..each $1.50@$1.75*
*Blacksmiths' Self-feeding* ..... *each $3.75@4.00*
Breast, Millers Falls, each $3.00 ..... 10&10%
Breast, P., S. & W ..... 40@40&5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3 ..... 16%
Johnson's Drill Points ..... 25&10%
Ratchet, Curtis & Curtis ..... 25%
Ratchet, Parker's ..... 40%
Ratchet, Weston's ..... 20@25%
Ratchet, Whitney's, P. S. & W ..... 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ..... 33⅓%

### Twist Drills—

*Standard List* ..... *60c&5@60c&10%*

### Drill Bits or Bit Stock Drills—See *Augers and Bits.*

### Drill Chucks—See *Chucks.*

### Dripping Pans—

See *Pans, Dripping.*

### Drivers, Screw—

*Screw Driver Bits ...per doz. 45@70c*
Balsey's Screw Holder and Driver, ₱ doz. 24-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros ..... 30%
Buck Bros' Screw Driver Bits ..... 30%
Champion ..... 40&10%
Douglass Mfg. Co ..... 20&20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet ..... 33⅓
Goodell's Automatic ..... 50&10&10@50&10&10&5%
Mayhew's Black Handle ..... 50%
Mayhew's Monarch ..... 40&10%
New England Specialty Co ..... 50&10%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60 ..... 50&10&10%
Nos. 20 and 40 ..... 60½&10%
Smith & Hemenway Co ..... 40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles 70@70&10&10%
No. 86 ..... 70@70&10&10%
Swan's:
Nos. 65 to 68 ..... 50%
No. 40 ..... 40&10%
Nos. 23, 35 and 45 ..... 20&10&10%

### Eave Trough, Galvanized

*Territory.* *L. C. L.*
*Eastern* ..... 75c&10@10%
*Central* ..... 75c&7½&c10%
*Southern* ..... 70c&7½&c10%
*S. Western* ..... 70c&10c&10%
Carloads extra 12½%
*Terms, 2% for cash.*
See also *Conductor Pipe and Elbows.*

### Egg Beaters—See *Beaters, Egg.*

### Egg Openers—

See *Openers, Egg.*

### Elbows and Shoes—

*Factory shipments* ..... 60@60&10%
Perfect Elbows (S. S. & Co.) ..... 40%

### Emery, Turkish—

| | 4 to 16 | 5 to 150 | Flour |
|---|---|---|---|
| *Kegs* ..... *lb.* | *5c* | *5½c* | *5½c* |
| ½ *Kegs* ..... *lb.* | *5½c* | *5¾c* | *5¾c* |
| *Kegs* ..... *lb* | *5c* | *6c* | |
| *10-lb cans, 10 in case* | *6½c* | *7c* | *6c* |
| *10-lb. cans, less than 10* | *10c* | *10c* | *8c* |

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

### Enameled and Tinned Ware—See *Ware, Hollow.*

### Escutcheon Pins—

See *Pins, Escutcheon.*

### Extractors, Lemon Juice —See *Squeezers, Lemon.*

### Fasteners, Blind—

Zimmerman's ..... 50&10%

### Faucets—

*Cork Lined* ..... 70c&5@70c&10c&5%
*Metallic Key, Leather Lined* ..... *70@70c&10%*
*Red Cedar* ..... *50@50c&10%*
B. & L. B. Co.:
Lockport, Metal Plug, reduced list 60&5%
Star ..... 60@60&5%
Star, Metal Plug new list ..... 40@40&5%
West's Lock, Open and Shut Key 50&10%
John Sommer's Peerless Tin Key ..... 40%
John Sommer's Boss Tin Key ..... 50%
John Sommer's Victor Metal Key. 50&10%
John Sommer's Duplex Metal Key ..... 60%
John Sommer's Diamond Lock ..... 40%
John Sommer's I. X. L. Cork Lined.. 50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined.. 60%
John Sommer's O. K. Cork Lined ..... 50%
John Sommer's No Brand, Cedar ..... 50%
John Sommer's Perfection Cedar ..... 40%
McKenna, Brass:
Burglar Proof, N. P ..... 35%
Improved, ¾ and ⅛ inch ..... 35%
Self Measuring:
Enterprise, ₱ doz. $36.00 ..... 40&10%
Lane's, ₱ doz. $36.00 ..... 40&10%
National Measuring, ₱ dos. $36.00.. 40%

### Felloe Plates—

See *Plates, Felloe.*

### Files—Domestic—

*List revised Nov. 1, 1899.*
*Best Brands* ..... *70@75&5%*
*Good Brands* ..... *75&10@75&10c10%*
*Fair Brands* ..... *80@80&10%*
*Second Quality* ..... *80&10@80&25%*

### Imported—

*Stubs' Tapers, Stubs' list, July 24, '97* ..... *25%*

### Fixtures, Grindstone—

*Net Prices:*

| *Inch....* | *15* | *17* | *19* | *21* | *24* |
|---|---|---|---|---|---|
| *Per doz.* | *$2.50* | *2.75* | *3.00* | *3 50* | *4.00* |

P., S. & W. Co ..... 50@50&5%
Reading Hardware Co ..... 60%
Sargent's ..... 60&10&10%
Stowell's Giant Grindstone Hanger ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures Light... 60&10%

### Fodder Squeezers—

See *Compressors.*

### Forks—

*Sept. 1. 1900, list.*
*Grain or Barley Forks, 13 to 20 inches* ..... *70c&6%*
*Hay, 2 tine* ..... *65%*
*Hay, 3 tine* ..... *66⅔%*
*Hay, 4 tine, Header and Barley Forks, 13 to 16 inches* ..... *66⅔%*
*Manure, 4 tine* ..... *70%*
*Manure, 5 and 6 tine* ..... *70%*
*Spading* ..... *70c&5%*
*Extra 10c&@8%*
Iowa Dig-Easy Potato ..... 65%
Victor, Hay ..... 66⅔%
Victor, Manure ..... 70%
Victor, Reader ..... 60&10%
Champion, Hay ..... 66⅔%
Champion, Manure ..... 70%
Columbia, Hay ..... 66⅔&5%
Columbia, Manure ..... 70%
Columbia, Spading ..... 70%
Hawkeye Wood Barley 4 tine ₱ dos. $5.00; 6 tine, $6.00.
W. & C. Potato Digger ..... 65%
Acme Hay ..... 60&10&7½%
Acme Manure, 4 tine ..... 60&20&10%
Acme Manure, 6 tine ..... 66⅔&10&2%
Dakota Reader ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Reader ..... 65&15&5%
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons.*

### Frames— Saw—

*Red, Polished and Varnished..doz. $1.15@$1.50*
*White* ..... *doz. 75@80c*

### Screens and Frames—

See *Screens.*

### Freezers Ice Cream—

| *Qts...* | *3* | *4* | *6* | *8* | *10* |
|---|---|---|---|---|---|
| *Best..* | *$1.45* | *1 65* | *1.95* | *2.40* | *3.20* | *4.2* |
| *Good* | *$1 25* | *1.40* | *1.70* | *2.15* | *2 75* | *3.7* |
| *Fair..* | *$1.00* | *1.10* | *1 30* | *1.75* | *2.37* | *3.2* |

### Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

### Fry Pans—See *Pans, Fry.*

### Fuse—

*Per 1000 Feet.*
*Hemp Fuse* ..... *$2.60*
*Cotton Fuse* ..... *2.90*
*Single Taped Fuse* ..... *3.25*
*Double Taped Fuse* ..... *4.20*
*Triple Taped Fuse* ..... *5.00*
10c&3½%

## Gates, Molasses and Oil—
Cobbins ..... 80@50&10%

## Gauges—
*Marking, Mortise, &c.* ..... *55&10@55&10c&10%*
Barrett's Comb. Roller Gauge ..... ₱ doz $6.75@7.25
Stanley R. & L. Co.'s Butt & Babbet Gauge ..... 90@20&10&10%
Wire, Brown & Sharpe's ..... 25%
Wire, Morse's ..... 25%
Wire P., S. & W. Co ..... 30@30&10%

## Gimlets— Single Cut—
*Nail, Metal, Assorted gro. $1.40@1.60*
*Spike, Metal, Assorted gro. $2.80@3.25*
*Nail, Wood Handled, Assorted, gro. $1.75@2.00*
*Spike, Wood Handled, Assorted gro. $2.25@3.50*

## Glass, American Window
*Jobbers' List, Jan. 21, 1901.*
*Less than Car Lots from Store....90%*
*Carloads from Store.....90c&7½%*
*Car Lot Consignments, f.o.b. factory, 9@12½%*

## Glue—Liquid, Fish—
*List A, Bottles or Cans, with Brush. 37½@50%*
*List B, Cans (½ pts., pts., qts.)..... 35½@48%*
*List C, Cans (½ gal., gal.) ....25@45%*
International Glue Co. (Martin's) ..... 4&10@50%

## Glue Pots—See *Pots, Glue.*

## Grease, Axle—
*Common Grade.....gro. $5.00@6.00*
Dixon's Everlasting....10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs., ½ doz. 1 lb $1.20; 2 lb $2.00
Snow Flake:
1 qt. cans per doz. $2.00; 2 qt., $3.20; 1 gal. cans per doz. $6.00; 3 gal. $16.00; 5 gal. $24.00 } 10%
Dixon's Everlasting, in bxs., ½ doz. 1 lb $1.20; 2 lb $2.00

## Grindstones—
Bicycle Emery Grinder ..... $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz.. ..... $2.00 } 33⅓%
Pike Mowe Knife and Tool Grinder, each ..... $6.00 }
Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

## Guards Snow—
Cleve and Wire Sawing Co.:
Galv. Steel ₱ 1000 ..... $9.00
Copper ₱ 1000 ..... $18.00

## Gun Powder—See *Powder.*

## Hack Saws—See *Saws.*

## Hafts Awl—
*gro.*
*Peg Patent, Leather Top..$4.50@5.25*
*Peg Patent, Plain Top....$3.50@3.75*
*Sewing, Brass Ferrule.....$1.50@1.60*
*Saddlers', Brass Ferrule..$1.35@1.45*
*Peg, Common .....$1.25@1.35*
*Brad, Common ..... $1.50@1.75*

## Halters and Ties—
Covert Mfg. Co.:
Web ..... 45&2%
Jute Rope ..... 45&2%
Sisal Rope ..... 30&2%
Covert's Saddlery Works:
Web and Leather Halters ..... 70%
Jute and Manila Rope Halters ..... 70%
Sisal Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties..70%
Sisal Rope Ties ..... 60&20%

## Hammers—
### Handled Hammers—
Heller's Machinists' ..... 50@50&5%
Heller's Farriers ..... 50@50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 40@40&10&10%
Peck, Stow & Wilcox ..... 50&10%
Fayette R. Plumb:
Plumb, A. E. Nail..33⅓&5@33⅓&10&5%
Engineers' and B. S. Hand ..... 50&10&7½@50&10&10&7½%
Machinists' Hammers ..... 50&10@50&10&10%
Riveting and Tinners' ..... 40&7½@40&10&7½%
Sargent's C. S. New List ..... 45%

### Heavy Hammers and Sledges—
*3 lb. and under...lb. 45c*
*3 to 5 lb .....lb. 36c* } *80@50&10%*
*Over 5 lb.....lb. 30c*
*Wilkinson's Smiths'.....9½c@10c lb.*

## Handcuffs and Leg Irons
See *Police Goods.*

## Handles—
### Agricultural Tool Handles—
*Axe, Pick, &c .....60@60&10%*
*Hoe Rake, Fork, &c.....60@50&10%*
*Shovel, &c., Wood D Handle.50@50&5%*

### Cross-Cut Saw Handles—
Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston's ..... 50%

### Mechanics' Tool Handles—
*Auger, assorted.....gro. $2.30@2.50*
*Brad Awl .....gro. $1.25@1.50*
*Chisel Handles:*
*Apple Tanged Firmer, gro. ass'd. $2.25@2.35; large, $2.50@2.60.*
*Hickory Tanged Firmer, gro. ass'd $1.75@2.20; large, $2.50@3.70.*
*Apple Socket Firmer, gro. ass'd, $1.70@1.85; large, $2.00@2.25*
*Hickory Socket Firmer, gro ass'd. $1.60@$1.75; large, $1.75@2.00*
*Hickory Socket Framing, gro. ass'd. $2.50@2.75; large, $2.75@3.85*
*File, assorted.....gro. $1.60@$1.15*
*Hammer, Hatchet, Axe, &c.....60%*
*Hand Saw, Varnished, doz. 70@75c*
*Not Varnished.. .....55@60c*
*Plane Handles:*
*Jack, doz. 25c; Jack Bolted..55@60c*
*Fore, doz. 35@38c; Fore, Bolted.. 70@75c*
Nicholson Simplicity File Handle, ₱ gro..... $0.85@$1.50

### Hangers—
*Barn Door, New Pattern, Round Groove, Regular:*

| *Inch* | *3* | *4* | *5* | *6* | *8* |
|---|---|---|---|---|---|
| *Doz* | $0.35 | 1.20 | 1.50 | 1.90 | 2.30 |

*Barn Door, New England Pattern, Check Back, Regular:*

| *Inch* | *3* | *4* | *5* | *6* |
|---|---|---|---|---|
| *Doz* | $1.30 | 1.75 | 2.50 | 3.00 |

Chicago Spring Butt Co.:
Friction ..... 25%
Oscillating ..... 25%
Big Twin ..... 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door ..... 50%
Elevator ..... 40%
Railroad ..... 55%
Columbian Hdw. Co.:
American Trackless ..... 33⅓&10%
Cronk Hanger Co.:
Loose Axle ..... 60%
Roller Bearing ..... 60&10%
Lane Bros.:
Parlor, Ball Bearing ..... $4.00
Parlor, Standard ..... $3.25
Parlor, New Model ..... $2.75
Parlor New Champion ..... $2.25
Parlor Door, Standard ..... 60&10%
Covered ..... 50&10&10&5%
Special ..... 60&10%
Lawrence Bros.:
Advance ..... 60%
Cleveland ..... 70%
Crown ..... 60%
New York ..... 60%
Perfection ..... 60&10%
Sterling ..... 60%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $15 ..... 60&10%
Stowell Mfg. and Foundry Co.:
Acme Parlor Ball Bearing ..... 40%
Atlas ..... 60%
Badger Barn Door ..... 50%
Baggage Car Door ..... 50%
Climax Anti-Friction ..... 50%
Elevator ..... 40%
Express ..... 50%
Interstate ..... 60%
Lundy Parlor Door ..... 50%
Magic ..... 50%
Matchless ..... 60%
Nansen ..... 60&10%
Railroad ..... 50%
Street Car Door ..... 50%
Steel, Nos. 300, 404, 500 ..... 40&15%
Stowell Parlor Door ..... 50%
Wild West, Nos. 300, 404, 500 ..... 5%
Zenith for Wood Track ..... 50%
Taylor & Boggs Foundry Co.:
Kidder's ..... 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing ..... 60%
Dwarf Ball Bearing ..... 40%
Ives, Wood Track ..... 60&10%
L. T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track ..... 60%
Richards' Wood Track ..... 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing ..... 40%
Velvet ..... 50%
Wilcox Auditorium Ball Bearing..20%
Wilcox Barn Trolley No. 123 ..... 4%
Wilcox Elevator Door Hangers, Nos 112 and 122½ ..... 5%
Wilcox Elevator Door Hangers No. 132 ..... 40%
Wilcox Fire Trolley, Roller Bearing ..... 40%
Wilcox Le Roy Noiseless Ball Bearing ..... 40%
Wilcox New Century ..... 50&10&10%
Wilcox O. K. steel Track ..... 50%
Wilcox O. K. Trolley ..... 50%
Wilcox Trolley Ball Bearing ..... 40%
Wilcox Wideman Narrow Gauge Ball Bearing ..... 40%

Extra 5@10% often given.

## Harness Menders—See *Menders.*

## Harness Snaps—See *Snaps.*

## Hasps—
McKinney's Perfect Hasp ₱ doz..... 50%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

## Hatchets—
*Best Brands.....50@50&10%*
*Cheaper Brands.....60@60&10%*
*Note.—Net prices often made.*

## Hay and Straw Knives—
See *Knives.*

## Hinges—
### Blind and Shutter Hinges—
*Surface Gravity Locking Blind: (Victor; National; 1838 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)*

| *No* | *1* | *3* | *5* |
|---|---|---|---|
| *Doz pair* | $0.75 | 1.45 | 2.90 |

*Mortise Shutter: (L. & P., O. S., Dixie, &c.)*

| *No* | *1* | *1½* | *2* | *2½* |
|---|---|---|---|---|
| *Doz. pair* | $0.60 | 53 | 32 | .45 |

*Mortise Reversible Shutter, (Buffalo, &c.)*

| *No* | *1* | *1½* | *2* |
|---|---|---|---|
| *Doz. pair* | $0.65 | .60 | .55 |

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Parker ..... 70@75%
Reading's Gravity ..... 75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13 ..... 70&10@70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S. Lull & Porter ..... 80&2½%
Acme, Lull & Porter ..... 75&10%
Queen City Reversible ..... 75&10%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10&5%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%
1895, Old Pat'n, Nos. 1, 3 & 5 ..... 75&7½%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75&7½%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%
Shepard's Double Locking, Nos. 20 & 25 ..... 70&10%
Champion Gravity Locking, No. 75 ..... 75&7½%
Steamboat Gravity Locking, No. 10 ..... 75&7½%
Pioneer, Nos. 080, 45 & 5½ ..... 75&7½%
Empire, Nos. 101 & 103 ..... 70&7½%
W. & H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Extra 5@10% often given on most of these Hinges.

### Gate Hinges—
*Clark's or Shepard's—Doz. sets:*

| *No* | *1* | *2* | *3* |
|---|---|---|---|
| *Hinges with Latches* | $1.80 | 1.90 | 2.65 |
| *Hinges only* | $1.50 | 1.50 | 2.00 |
| *Latches only* | .60 | .60 | .65 |

*New England:*
*With Latch .....doz ....@$1.55*
*Without Latch ....doz. ....@$1.35*
*Reversible Self-Closing:*
*With Latch .....doz. ....@$1.80*
*Without Latch.....doz. ....@$1.45*
*Western:*
*With Latch.....doz. $1.50@1.75*
*Without Latch.....doz. $0.95@1.20*
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

| No. | 1 | 2 | 3 |
|---|---|---|---|
| Hinges with Latches | $1.80 | 2.00 | 2.75 |
| Hinges only | 1.20 | 1.50 | 2.10 |
| Latches only | .65 | .85 | .70 |

### Spring Hinges—
*Holdback, Cast Iron, gro $8.00@9.00*
*Non-Holdback, Cast Iron..... gro $7.00@7.50*
J. Bardsley
Bardsley's Patent Checking ..... 15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges ..... 40%
Bommer Spring Hinges ..... 40%
Chicago Spring Butt Co.:
Chicago ..... 25%
Floor Hinge ..... 50%
Garden City Engine House ..... 25%
Keene's Saloon Door ..... 25%
Triple End ..... 50%
Columbian Hdw. Co.:
Acme, Wrt. Steel ..... 30%
Acme, Brass ..... 20%
American ..... 30%
Columbia, No. 14 ..... ₱ gr. $9.00
Columbia, No. 18 ..... ₱ gr. $25.00
Columbia, Adjustable ..... 30%
Gem, new list ..... 25%
Clover Leaf ..... ₱ gr. $12.50
Oxford, new list ..... 25%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable $8.50
Lawson Mfg. Co.:
Machine ..... 35%
Matchless Pivot ..... 45%
Payson Mfg. Co.:
Oblique ..... 50&10%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $12.50
Ideal, No. 4 ..... ₱ gr. $9.00
New Idea No. 1 ..... ₱ gr. $9.00
New Idea, Double Acting ..... 45%

Extra 10% often given on Extra 2@5 Lt's

### Wrought Iron Hinges—
*Strap and T Hinges, &c., list Mar. 15, 1901:*
*Light Strap Hinges..... 70%*
*Heavy Strap Hinges.. 75&10%*
*Light T Hinges..... 66⅔%*
*Heavy T Hinges..... 60&5%*
*Extra Heavy T Hinges....75%*
*Hinge Hasps ..... 55%*
*Cor. Heavy Strap .....75&10%*
*Cor. Ex. Heavy T..... 75%*
*Screw Hook and Strap: 6 to 12 in..... lb. 3½c; 12 to 20 in..... lb. 3 c; 22 to 36 in..... lb. 2¾c*
*Screw Hook and Eye:*
*¾ to 1 inch..... lb 5 c*
*⅝-inch..... lb 6 c*
*½-inch..... lb. 7 c*

### Miscellaneous—
Hoffman's Steel Spring Butt Hinges ..... 40&10%
Hoffman's Offset Refrigerator Hinges ..... 40&10%

## Hods, Coal—

| | *15* | *16* | *17* | *18 inch.* |
|---|---|---|---|---|
| *Galv. Open* | $2.70 | 3.00 | 3.30 | 3.60 ₱ doz. |
| *Jap. Open* | $2.10 | 2.40 | 2.70 | 3.00 ₱ doz. |
| *Galv. Funnel* | $3.30 | 3.60 | 3.90 | 4.20 ₱ doz. |
| *Jap. Funnel* | $2.70 | 3.00 | 3.30 | 3.60 ₱ doz. |

## Hoes—Eye—
*Scovil and Oval Pattern, 60c&5@60c&10c&5%*
*Grub, list Feb. 23, 1899,... 70@70c&10%*
D. & H. Scovil ..... 35%

## Handled—
*Sept. 1, 1900, List:*
*Field and Garden..... 75c&2%*
*Ladies', Boys', Toy and Onion... 70c&10c&10%*
*Street and Mortar ..... 75c&7½c&2%*
*Cottons..... 70c&10c&10c&5c&2%*
*Planters'..... 70c&30%*
*Weeding..... 75%*
*Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.*
Ft. Madison Crucible Garden Hoe ..... 75c&3%
Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10c&2%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. $4.50
Junior Size ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.80
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy, per doz.....75&2%
Warren Hoe ..... 60%
W. & C. Ivanhoe ..... 75&2%
B. B. Cultivator Hoe ..... 75&10&2%
Acme Weeding ..... 75&10&2%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

## Hog Rings and Ringers—
See *Rings and Ringers.*

## Hoisting Apparatus—
See *Machines, Hoisting.*

## Hollow Ware—
See *Ware, Hollow.*

## Holders—
### Dirt—
Angular, ₱ doz. $24.00 ..... 45&10%
### Door—
Empire ..... 50%

## File and Tool—
C. E. Jennings & Co. Model Tool Holders ..... 33⅓%
Nicholson File Holders and File Handles ..... 33⅓%

## Hooks—
### Cast Iron—
Bird Cage, Reading ..... 60%
Bird Cage, Sargent's List.....50&10@60%
Ceiling, Sargent's List..... 40&10%
Clothes Line, Hoffman's..... ....40&10%
Clothes Line, Reading List ..... 65&10@65&10&10%
Clothes Line, Sargent's List 50&10&10%
Coat and Hat, Sargent's List.....45&10%
Clothes Line, Stowell's..... 70%
Coat and Hat, Stowell's ..... 70%
Coat and Hat, Reading ..... 70&10&5%
Coat and Hat, Wrightsville ..... 65&10%
Harness, Reading List.....70&10@75%

### Wire—
*Belt..... 80%*
*Wire C. & H. Hooks..60c&10@60c&10c&5%*
Atlas, Coat and Hat:
Single Cases ..... 45%
10 Case Lots ..... 45&10%
Czar Harness ..... 50&10&5%
Wire Coat and Hat:
Acme ..... 60%
B. B ..... 60%
V Brace, Chief and Czar ..... 60%
Gem ..... 60%
Bright Wire Goods—See *Wire.*

### Wrought Iron—
*Box, 6 in., per doz. $1.50; 8 in., $1.75; 10 in., $2.00.*
*Cotton ..... doz. $1.05@1.25*
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

### Miscellaneous—
*Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50*

| *Grass.....Nos.* | *1* | *2* | *3* | *4* |
|---|---|---|---|---|
| *Best* | $1.50 | 1.75 | 2.00 | |
| *Common* | $1.30 | 1.50 | 1.40 | 1.60 |

*Potato and Manure ..... 70%*
*Whiffletrees..... lb. 4¼c*
*Hooks and Eyes:*
*Brass..... 60c&10c&10@70%*
*Malleable Iron..... 70c&5@70c&10%*
Covert Saddlery Works' Self Locking Gate and Door Hook ..... 60%
Crown Picture ..... 50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

## Horse Nails—See *Nails, Horse*
## Horseshoes—
See *Shoes, Horse.*

## Hose Rubber—
*Garden Hose, ¾-inch:*
*Competition..... ft. 4¼@4¾c*
*3-ply Standard ..... ft. 5 @6 c*
*4-ply Standard..... ft. 8 @9 c*
*3-ply extra ..... ft. 9 @10 c*
*4-ply extra ..... ft. 11 @12 c*
*Cotton Garden, ¾-in., coupled:*
*Low Grade ..... ft. 6 @7 c*
*Fair quality..... ft. 8 @9 c*

## Irons—Sad—
*From 4 to 10..... lb 3@3¼c*
*B. B. Sad Irons..... lb. 3¼@3½c*
*Chinese Laundry..... lb. 5@5½c*
*Chinese Sad..... lb. 3½@3¾c*
*Mrs. Potts', per set:*

| *Nos.* | *50* | *55* | *60* | *65* |
|---|---|---|---|---|
| | *65@70c* | *60@65c* | *75@80c* | *70@75c* |

*New England Pressing..lb.. 3¼@3½c*

## Soldering—
*Soldering Coppers, 1 & 1¼ lb., 21@22*
*2 lb., and up..... 19@20c*
Covert Mfg. Co..... 20&2%
Smith & Hemenway Co's Sets..... 70%

## Pinking—
*Pinking Irons..... doz. 50@60c*

## Jack Screws—See *Screws.*
## Jacks, Wagon—
Covert Mfg. Co., Steel ..... 45&2%
Covert's Saddlery Works':
Daisy ..... 60&10%
Victor ..... 60&10%
Lockport ..... 40@40&10%
Lane's Steel ..... 33⅓&5%

## Kettles—
*Brass, Spun, Plain..... ..20@25%*
Enameled and Cast Iron—See *Ware, Hollow.*

## Knife Sharpeners—
See *Sharpeners, Knife.*

## Knives—
### Butcher, Shoe, &c.—
Foster Bros.' Butcher, &c..... 30%
Hartzell Cutlery Co..... 30&5%
Smith & Hemenway Co ..... 40&10%
Hay and Straw—See *Hay Knives.*

### Corn—
Ft. Madison Cut-Easy, ₱ doz..... $3.35
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

### Drawing—
*Standard List.....70c&5@70c&10%*
Adjustable Handle ..... 25%
Bradley's ..... 35%
Canteio's Folding ..... 50@50&5%
C. E. Jennings & Co. Nos. 45, 46. 40&10%
Jennings & Griffin..... 66⅔&5%
Swan's ..... 70&10c&2½%
Watrous ..... 25%
L. & L. J. White ..... 20c&5@25%

### Hay and Straw—
*Lightning..... per doz. $5.00@5.25*
Iwan's Sickle Edge..... ₱ doz. $10.00
Iwan's Serrated..... ₱ doz., $11.00
Maine ..... ₱ doz. $8.50

### Mincing—
Buffalo ..... ₱ gro. $15.00

### Miscellaneous—
*Farriers'..... doz. $2.00@3.00*
Wostenholm's..... ₱ doz. $3.00@3.25

## Knobs—
*Base, 2¼-inch, Birch, or Maple.*
*Rubber tip, gro .....$1.20@1.25*
*Carriage, Jap. all sizes..gro. 30@35c*
*Door, Mineral..... doz. 60@65c*
*Door, Por. Jap'd..... doz. 65@70c*
*Door, Por. Nickel.....doz. $2.00@2.10*
Bardsley's Wood Door, Shutter, &c....15%
Picture, Sargent's..... 60&10%

## Lacing Leather—
See *Belting, Leather—*

## Ladders, Step, Etc.—
Goshen Mfg. Co..... ..50%

**Ladies' Melting**
L. & C. Mfg. Co. ..... 25%
P. S. & W. ..... 50%
Reading ..... 60%
Sargent's ..... 40@40&10%

**Lanterns' Tubular**
*Regular Tubular* ..... doz. $4.35@4.75
*Side Lift Tubular* ..... doz. $4.75@5.25
*Square Lift Tubular* ..... doz. $4.75@5.25
*Other Styles* ..... 40@10@40@10@5%

**Bull's Eye Police**
*No. 1, 2¼ inch* ..... $3.60
*No. 2, 3 inch* ..... $4.00

**Latches, Thumb**
*Roggen's Latches* ..... doz. 30@33c

**Lawn Mowers**
See *Mowers, Lawn.*

**Leaders, Cattle**
*Small* ..... doz. 50c; large, 85c
Covert Mfg. Co. ..... 45&2%

**Lemon Squeezers**
See *Squeezers, Lemon.*

**Lifters, Transom**
Solid Grip, Payson Mfg. Co. ..... 80%
R. & ..... 45%

**Lines**

| | 18 | 19 | 20 |
|---|---|---|---|
| *Wire Clothes, Nos...* | | | |
| *100 feet* | $2.20 | 2.00 | 1.65 |
| *50 feet* | $1.80 | 1.70 | 1.30 |

Ossawan Mills:
Crown Solid Braided Chalk ..... 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00;
No. 1, $6.50; No. 2, $7.00; No. 3, $7.50
₩ gr. ..... 30%

**Locks—Cabinet**
*Cabinet Locks* ..... 33⅓@33⅓&7½%

**Door Locks, Latches, &c.**
[Net prices are very often made on these goods.]
Reading Hardware Co. ..... 50%
R. & E. Mfg. Co. ..... 50%
Sargent & Co. ..... 40@40&10%

**Elevator**
Stowell's ..... 40%

**Padlocks**
*Wrought Iron* ..... 10&10&5@30&5%
R. & E. Mfg. Co. Wrt. Steel and Brass. 50%

**Sash, &c.**
Fitch's:
Bronze and Brass ..... 66⅔%
Iron ..... 70%
Ives' Patent:
Bronze and Brass ..... 62½%
Iron ..... 65%
Wrought Bronze and Brass ..... 55&5%
Wrought Steel ..... 60%
Payson's signal ..... 80%
Reading ..... 60&10&10@70%

**Machines—Boring**
*Common, Upright, Without Augers,* $2.00
*Common, Angular, Without Augers,* $2.25

Without Augers.

| R. & E. Mfg. Co.: | Upright. | Angular. |
|---|---|---|
| Improved No. 3 | $4.25 | No. 1 $5.00 |
| Improved No. 4 | 3.75 | No. 2 3.38 |
| Improved No. 5 | 2.75 | |
| Jennings' | 2.50 | 3.00 |
| Millers' Falls | | 5.75 |
| Snell's, Rice's Pat. | 2.50 | 2.75 |
| Swan's, No. 500.. | 5.10 | No. 200 6.45 |

**Hoisting**
Moore's Anti-Friction Differential Pulley Block ..... 30%
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Portable Pneumatic Hoist ..... 35%

**Ice Cutting**
Chandler's ..... 15%

**Washing**
Wayne American ..... ₩ doz. $28.00
Western Star, No. 2 ..... ₩ doz. 28.00
Western Star, No. 3 ..... ₩ doz 30.00
St. Louis, No. 41 ..... ₩ doz. 60.00

**Mallets**
*Hickory* ..... 45&5@50%
*Lignumvitæ* ..... 45&5@50%
*Tanners', Hickory and Applewood, doz* ..... 50@55c

**Mats—Door**
Elastic Steel (W.G. Co.) ..... 10%

**Mattocks**
See *Picks and Mattocks.*

**Meat Cutters**
See *Cutters, Meat.*

**Milk Cans**—See *Cans, Milk*

**Mills—Coffee**
Enterprise Mfg. Co. ..... 25@30%
National, list Jan. 1, '94 ..... 30%
Parker's Columbia and Victor ..... 50&10@60%
Parker's Box and Side ..... 50&10@60%
Swift, Lane Bros. ..... 30%

**Mincing Knives**
See *Knives, Mincing.*

**Molasses Gates**
See *Gates, Molasses.*

**Money Drawers**
See *Drawers, Money.*

**Mowers, Lawn**
*Net prices are generally quoted.*
*Cheap* ..... *all sizes, $1.90@1.95*
*Good* ..... *all sizes, $2.25@2.50*

| | 10 | 12 | 14 | 16-inch |
|---|---|---|---|---|
| *High Grade* | 4.25 | 4.50 | 4.75 | 5.00 |
| Continental | | | | 60&10&5% |
| Great American | | | | 70&5% |
| Great American Ball Bearing | | | | 60&10&5% |
| Quaker City | | | | 70&5% |
| Pennsylvania | | | | 60&10&5% |
| Pennsylvania Golf | | | | 50% |
| Pennsylvania Horse | | | | 40% |
| Pennsylvania Pony | | | | 45% |
| Philadelphia: | | | | |
| Style M., S., C., K., T. | | | | 70&5% |
| Style A, all Steel | | | | 60&10% |
| Style E, Low Wheel | | | | 60&10% |
| Style E, High Wheel | | | | 70&10&5% |
| Drexel and Gold Coin, low list | | | | 50&5% |

**Nails**
*Cut and Wire. See Trade Report.*
*Wire Nails and Brads, Papered. List July 20, 1899* 85&10@85&10&10%

*Hungarian, Finishing, Upholsterers', &c. See Tacks.*

**Horse**

| Nos. | 6 | 7 | 8 | 9 | 10 | |
|---|---|---|---|---|---|---|
| A. C. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ | 40&5% |
| Ausable | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | 50&10% |
| Capewell | 19¢ | 18¢ | 17¢ | 16¢ | 16¢ | 10&5% |
| C. B. K. | 25¢ | 25¢ | 23¢ | 21¢ | 21¢ | 40% |
| Champ'n | 28¢ | 26¢ | 25¢ | 24¢ | 23¢ | 40&10&5% |
| Clinto | 19¢ | 17¢ | 16¢ | 15¢ | 14¢ | 30&10&5% |
| Maud S. | 25¢ | 23¢ | 22¢ | 21¢ | 21¢ | 50% |
| Putnam | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | 33⅓% |
| Vulcan | 23¢ | 21¢ | 20¢ | 19¢ | 18¢ | 25&10% |
| American, Nos. 5 to 10 | | | | | | 9@9½¢ |
| Neponset | Nos. 5 to 10¢ ₩ lb | | | | | 12¢ |

*Jobbers' special brands...per lb. 8@9c*

**Picture**

| | 1½ | 2 | 2½ | 3 | 3½ in. |
|---|---|---|---|---|---|
| *Brass Head* | .45 | .60 | .70 | .95 | 1.00 gro. |
| *Por. Head* | .. | 1.10 | 1.10 | 1.10 | .. gro. |

**Nippers,** See *Pliers and Nippers.*

**Nut Crackers**
See *Crackers, Nut.*

**Nuts**
*Cold Punched:* *Off list.*
*Mfrs. or U. S. Standard.*
*Square, plain* ..... $5.00@5.10
*Hexagon, plain* ..... $5.30@5.40
*Square, C. T. & R.* ..... $5.20@5.30
*Hexagon, C. T. & R.* ..... $5.30@5.90
*Hot Pressed:*
*Mfrs., U. S. or Nar. Gauge Stan'd.*
*Square Blank* ..... $5.20@5.30
*Hexagon Blank* ..... $5.30@5.90
*Square Tapped* ..... $5.00@5.10
*Hexagon Tapped* ..... $5.30@5.70

**Oakum**
*Best or Government* ..... *lb.* 6¼¢
*Navy* ..... *lb.* 5 c
*U. S. Navy* ..... *lb.* 5½¢
*Plumbers' Spun Oakum* ..... 8¾¢
*In carload lots ¼c lb. off f.o.b. New York.*

**Oil Axle**
Snow Flake:
1 pt. cans, per doz. ..... $3.00
1 qt. cans, per doz. ..... $4.80
1 gal. cans, per doz. ..... $15 00
5 gal. cans, per doz. ..... $66.00
} 33⅓&10%

**Oil Tanks**—See *Tanks, Oil.*

**Oilers**
*Brass and Copper* ..... 40¢&10%
*Tin or Steel* ..... 60¢&10%
*Zinc* ..... 60¢&10%
*Paragon:*
*Brass and Copper* ..... 40¢&10%
*Tin or Steel* ..... 60¢&10%
*Zinc* ..... 60¢&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Wilmot & Hobbs Mfg. Co.:
Spring Bottom Cans ..... 70&70&10%
Railroad Oilers etc. ..... 60&30&10%

**Openers' Can**
*French* ..... *doz.* 35c
*Iron Handle* ..... *doz.* 25@27c
*Sprague, Iron Hdle.* ..... *per doz* 35@40c
*Sardine Scissors* ..... *doz.* $1.75@3.00
Tip Top ..... per doz. $0.75
National, ₩ gro. ..... $1.75@$2.00
Stowell's ..... per doz. 35@45c
Waldorf, ₩ gro. ..... $3.65

**Egg**
Nickel Plate ..... per doz., $2.25
Silver Plate ..... per doz., $3.50

**Packing**
*Asbestos Packing, Wick and Rope,* 15@15½c lb.

**Rubber**
*Sheet, C. I.* ..... 8@12c
*Sheet, C. O. S.* ..... 9@13c
*Sheet, C. B. S.* ..... 10@14c
*Sheet, Pure Gum* ..... 50@70c
*Sheet, Red* ..... 35@40c
Jenkins' Standard, ₩ lb 80¢ ..... 25@25&5%

**Miscellaneous**
*American Packing* ..... 7@10c lb.
*Cotton Packing* ..... 13@14c lb.
*Italian Packing* ..... 9@12½c lb.
*Jute* ..... 3½@4c lb.
*Russia Packing* ..... 7@11c lb.

**Pails—Creamery**
S. S. & Co., with gauges.. No 1 $6.50; No. 2, $6.75 ₩ doz.

**Galvanized**
Price per gro.

| | Quart | 10 | 12 | 14 |
|---|---|---|---|---|
| *Water, Regular* | .. | 18.00 | $1.00 | $4.00 |
| *Water, Heavy* | .... | 24.00 | 27.00 | 30.00 |
| *Fire, Rd. Bottom* | | $1.00 | $5.00 | $5.00 |
| *Well* | ..... | 27.00 | 29.00 | $1.00 |

**Pans—Dripping**
*Standard List* ..... 50¢&10@50¢&10%

**Fry**
*Common Lipped:*

| *No.* | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| *Per doz.* | $0.60 | .75 | .85 | .95 | 1.15 |

**Roasting and Baking**
Regal, S. S. & Co., ₩ doz., Nos. 5, $4.50; 10 $5.00; 20 $5.50; 30, $6.00
Simplex, ₩ gro., No. 40 $30.00; 50, $34.50; 60 $39 00; 140, $33.00; 150, $37.50; 160, $43.00.

**Paper—Building Paper**
*Asbestos:* *lb.*
*Building Felt* ..... 3c
*Mill Board, sheet, 40 x 40 inches* ..... 4c
*Mill Board, roll, thicker than 1-16 inch* ..... 3c
*Mill Board, roll, 1-16 in. thick and less* ..... 3c

*Per roll*
*Rosin Sized Sheathing:* *500 sq. ft.*
*Light wt., 20 lbs. to roll* ..... $0.33
*Medium wt., 30 lbs. to roll* ..... $0.47
*Heavy wt., 40 lbs. to roll* ..... $0.58
*Medium Grades Water Proof Sheathing* ..... $0.65@1.25
*Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton* ..... $40.00@42.00
*Red Rope Roofing, 250 sq. feet per roll* ..... $1.65

**Tarred Paper**
*1 ply (roll 500 sq. ft.), ton* ..... $38.00@30.00
*2 ply, roll 108 sq. ft* ..... 40@45c
*3 ply, roll 108 sq. ft* ..... 60@65c
*Slater's Felt (roll 500 sq. ft.)* ..... 50@60c
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) ..... $2.75

**Sand and Emery**
*List Dec. 28, 1899* ..... 60@60&5%

**Parers—Apple**
Advance ..... ₩ doz. $4.50
Baldwin ..... ₩ doz. $5.00
Bonanza ..... each $9.00
Dandy ..... each $7.50
Eureka, 1898 ..... each $10.00
Family Bay State ..... ₩ doz. $12.00
Hudson's Little Star ..... ₩ doz. $4.00
Hudson's Rocking Table ..... ₩ doz $5.50
Improved Bay State ₩ doz. $27.00@30.00
New Lightning ..... ₩ doz. $5.50
Reading 72 ..... ₩ doz. $4.00
Reading 78 ..... ₩ doz. $7.00
Turn Table '98 ..... ₩ doz. $5.50
White Mountain ..... ₩ doz. $4.00

**Potato**
Saratoga ..... ₩ doz. $5.50
White Mountain ..... ₩ doz. $4.50

**Paris Green** *per lb.*
*Arsenic kegs or casks* ..... 11 @11½c
*Kegs, 100 to 175 lbs* ..... 11½@12 c
*Kits, 14, 28, 56 lbs* ..... 12½@13 c
*Paper boxes, 2 to 5 lbs* ..... 13 @13 c
*Paper boxes, 1 lb* ..... 13 @14½c
*Paper boxes, ½ lb* ..... 14 @14½c
*Paper boxes, ¼ lb* ..... 15 @15½c

**Picks and Mattocks**
*List Feb. 25, 1899* ..... 70@70&10%

**Pigeons—Clay**
Markle's Black Birds, f.o.b. factory, per m ..... $3.75
See also *Traps, Target.*

**Pinking Irons**
See *Irons, Pinking.*

**Pins—Escutcheon**
*Brass* ..... 60%
*Iron, list Nov. 11, '85* ..... 60%

**Pipe, Cast Iron Soil**
*Standard, 2-inch* ..... 60&7½%
*Extra Heavy, 2-6 in.* ..... 70%
*Fittings* ..... 75&5%

**Pipe, Merchant, Boiler Tubes, &c.**

| *Merchant Pipe.* | Black. | Galvanized |
|---|---|---|
| ¼ to ⅜ inch | 61% | 48% |
| ¼ to 10 inch | 68½% | 56% |
| *Boiler Tubes* | | Up to |
| *Steel.* | | 22 feet |
| *1 to 1¼ inch and 2¾ to 5 inch inclusive* | | 65½% |
| *2 to 2½ inch, inclusive* | | 60% |
| *6 to 10 inches* | | 55% |
| *Iron.* | | |
| *1 to 1½ inch and 2½ in.* | | 43½% |
| *1¾ to 2¼ inch* | | 45% |
| *2¾ to 13 inch* | | 55% |
| *Casing, Cut Lengths.* | | S. & S. |
| *2 to 8 inch* | | 63½% |
| *3¼ to 4 inch* | | 5% |
| *4½ to 12½ inch* | | 61½% |

**Pipe, Sewer**
*Standard Pipe and Fittings, 2 to 24 in.*
*New England* ..... 70%
*New York and New Jersey* ..... 75%
*Ohio and Michigan* ..... 80%
*Carload lots are generally delivered.*

**Planes and Plane Irons—Wood Planes**
*Molding* ..... 40&2½@40&10%
*Bench, First quality* ..... 45&10@45&10&5%
*Bench, Second quality* ..... 50&10@50&10&5%
Bailey's (Stanley R. & L. Co) ..... 25&10@25&10&10%
Gage Self Setting ..... 35%

**Iron Planes**
Bailey's (Stanley R. & L. Co) ..... 25&10@25&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10@25&10&10%
Sargent's ..... 50&10&10%

**Plane Irons**
*Wood Bench Plane Irons* ..... 30&5@30&10&5%
Buck Bros. ..... 30%
Stanley R. & L. Co. ..... 30&10@30&10&10%
L. & I. J. White ..... 30&5@25%

**Planters, Corn, Hand.**
Kohler's Eclipse ..... ₩ doz. $9.00

**Plates**
*Fellos* ..... *lb* 53½@4c
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00 ..... 50%

**Pliers and Nippers**
*Button Pliers* ..... 70c&10@75%
*Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45*
*Gas Pipe* .. 7 8 10 12-in.
$1.75 $2.00 $2.75 $3.75
Acme Nippers ..... 50@50&5%
Bernard's:
Parallel Pliers, &c. ..... 35%
Paragon Pliers ..... 50&5%
Lodi Pliers ..... 30&5%
Elm City Fence Pliers ..... 35%
Cronk Hanger Co.:
American Button ..... 75&10%
Cronk's ..... 60%
Improved Button ..... 70&10%
Stub's Pattern ..... 50%
Combination and others ..... 25%
Heller's Farriers' Nippers, Pincers and Tools 50@50&5%
P., S. & W. Tinners' Cutting Nippers, 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers ..... 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds ..... 40%

**Plumbs and Levels**
*Plumbs and Levels* ..... 75@75&10%

Davis Iron, Machinist Nos. 1 to 14 ..... 20%
Davis Iron, Adjustable Nos. 6 to 49 ..... 35%
Disston's ..... 70%
Pocket Levels ..... 75&10&10@75&10%
Stanley R. & L. Co. ..... 40@40&10&10%
Stanley's Duplex ..... 20@20&10&10%
Woods' Extension ..... 33⅓%

**Poachers, Egg**
Buffalo Steam Egg Poachers, ₩ doz., No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50 ..... 50%

**Points, Claziers'**
*Bulk and 1 lb. papers* .. *lb.* 8 c@..
*½-lb. papers* ..... *lb.* 8½c@..
*¼-lb. papers* ..... *lb.* 9 c@..

**Pokes, Animal**
Ft. Madison Hawkeye ..... ₩ doz. $3.25
Ft. Madison, Western ..... ₩ doz. $3.75

**Police Goods**
*Manufacturers' Lists* ..... 25@25&5%
Tower's ..... 25%

**Polish—Metal**
Prestoline Liquid, No. 1 (½ pt.), ₩ doz. $3.00; No. 2 (1 qt.), $9.75 ..... 40%
Prestoline Paste ..... 40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gr. $4.50; ½ ℔ boxes, ₩ doz. $1.25; 1 ℔ boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz. $1.25; ₩ gr. $12.00.
Barkeepers' Friend Metal Polish, ₩ doz. $1.75; ₩ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₩ doz. ..... $2.00

**Stove**
Black Eagle Benzine Paste, 5 ℔ cans, ₩ ℔ 10¢
Black Eagle, Liquid, ½ pt. cans, ₩ doz. 75¢
Black Jack Paste, ¾ ℔ cans, ₩ gro. $9.00
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ ℔ 8¢
Fireside ..... ₩ gr. $2.50
Gem, ₩ gr. $4.50 ..... 10%
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, ½ pt. cans, ₩ doz. $1.50
Wynn's:
Black Silk, 5 ℔ pail ..... each 70¢
Black Silk, ½ ℔ box ..... ₩ doz. $1.00
Black Silk, 5 oz. box ..... ₩ doz. $0.75
Black Silk, ½ pt. liq. ..... ₩ doz. $1.00

**Poppers, Corn**
*Round or Square:*
*1 qt* ..... *gro.* $7.00@$7.50
*1½ qt* ..... *gro.* 9 50@ 10.00
*2 qt* ..... *gro.* 10.50@ 11.00

**Post Hole and Tree Augers and Diggers**
See also *Diggers, Post Hole, &c.*

**Potato Parers**
See *Parers, Potato.*

**Pots—Glue**
*Enameled* ..... 45%
*Tinned* ..... 40%

**Powder**
*In Canisters:*
*Duck, 1 lb. each* ..... 15c
*Fine Sporting, 1 lb. each* ..... 75c
*Rifle, ½-lb. each* ..... 15c
*Rifle, 1-lb. each* ..... 25c
*In Kegs:*
*Duck, 6¼-lb. kegs* ..... $2.25
*Duck, 12½-lb. kegs* ..... $4.25
*Duck, 25-lb kegs* ..... $8.00
*Rifle, 6¼-lb kegs* ..... $2.25
*Rifle, 12½-lb. kegs* ..... $2.25
*Rifle, 25-lb. kegs* ..... $4.00
King's Semi-Smokeless:
Keg (25 ℔ bulk) ..... $6.50
Half Keg (12½ ℔ bulk) ..... $3.50
Quarter Keg (6¼ ℔ bulk) ..... $1.90
Case 24 (1 ℔ cans bulk) ..... $8.50
Half case (1 ℔ cans bulk) ..... $4 50

| King's Smokeless: | Shot Gun | Rifle |
|---|---|---|
| Keg (25 ℔ bulk) | $12 00 | $15.00 |
| Half Keg (12½ ℔ bulk) | 6.25 | 7.75 |
| Quarter Keg (6¼ ℔ bulk) | 3.25 | 4.00 |
| Case 24 (1 ℔ cans bulk) | 14.00 | 17.00 |
| Half case 12 (1 ℔ cans bik) | 7.25 | 8 75 |

**Presses—Fruit and Jelly**
Enterprise Mfg. Co. ..... 30@25%

**Pruning Hooks and Shears**—See *Shears.*

**Pullers, Nail**
Cyclops ..... 40@40&10%
Smith & Hemenway Co.:
Diamond B, No. 2, case lots, ₩ doz $6.00
Diamond B, No. 3, case lots, ₩ doz $5.50
Giant, No. 1, ₩ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%
Miller's Falls, No. 3, per doz. $12.00 ..... 15&10%
Pelican ₩ doz. $9.00 ..... 40&10%
Scranton, Case Lots:
No. 1 (large), ₩ doz. $6.50; No. 2 (large), $5.75; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $4.50; No. 1-D (large), $4 50; No 3-D (small) $4.00.

**Pulleys—Single Wheel**

| *Inch* | 2 | 2½ | 3 |
|---|---|---|---|
| *Awning ..doz.* | $0.45 | .70 | .95 |
| *Inch* | 2 | 2¼ | 2½ |
| *Hay Fork, Swivel or Solid Eye* | doz. | $1.25 | $1.50 |
| *Hot House..doz* | $0.65 | .90 | 1.20 |
| *Inch* | 1¼ | 1½ | 2 |
| *Screw.....doz.* | $0.15 | .20 | .25 |
| *Inch* | 1¼ | 2 | 2½ |
| *Side.....doz.* | $0.30 | .40 | .55 |
| *Inch* | 1¼ | 1½ | 2 |
| *Tackle....doz.* | $0.30 | .45 | .65 |

Stowell's:
Ceiling or End, Anti-Friction ..... 60%
Dumb Waiter, Anti-Friction ..... 60&10%
Hay Fork, Anti-Fricton, 5-in. Wheel, ₩ doz. $12.00 ..... 50%
Electric Light ..... 60%
Side, Anti-Friction ..... 60&10%

**Sash Pulleys**
*Common Frame; Square or Round End* per doz., 1¼ in., 13c.; 2 in., 18c
*Auger Mortise, no Face Plate, per doz.* 1¼ in., 11c.; 2 in., 15c.
*Auger Mortise, with Face Plate, per doz.*, 1¼ in , 13c.; 2 in., 16½c.

Acme.....1¼ in., 16¢; 2 in., 19¢
Common Sense, 1¼ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2¼ in.....
₱ doz. 25¢
No. 9, 1¾ in.....
₱ doz. 20¢
Extra for Plated Finish....₱ doz. 20¢
Extra for Anti-Friction Bronze Bushing.....
₱ doz 10¢
Grand Rapids All Steel Noiseless....40%
Ideal No. 13.....1¾ in., ₱ doz., 16¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

## Pumps—

*Cistern*.....60@60&10%
*Pitcher Spout*.....75@75&10%
*Wood*.....50@50&10%
*Pump Leathers, Lower and Plunger Valves—Per gro.:*

| *Inch..* | 2 | 2¼ | 2½ | 2¾ |
|---|---|---|---|---|
| | *$2.20* | *2.50* | *2.75* | *3.00* |
| *Inch..* | 3 | 3¼ | 3½ | 3¾ | 4 |
| | *$3.30* | *3.60* | *3.85* | *4.10* | *4.40* |

Barnes Dbl. Acting (low list).....50%
Flint & Walling's Fast Mail (low list).50%
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. S. Co.....20%
Myer's Pumps, low list.....50%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....30%

## Punches—

*Revolving (4 tubes)...doz. $3.75@4.25*
*Saddlers' or Drive, good..doz. 65@70c*
*Spring, single tube, good quality...*
*$1.65@1 75*
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.....
35@35&5%
Tinners' Solid, P., S. & W.Co., ₱ doz., $1.44.....60%

## Rail— Barn Door, &c.—

*Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:*

| ½ | ⅝ | ¾ | In. |
|---|---|---|---|
| *$1.70* | *$2.10* | *$3.00* | *100 feet.* |

*Angular for Sq. Groove Wheels:*

| *Small.* | *Med.* | *Large.* | |
|---|---|---|---|
| *$1.60* | *1.95* | *2.70* | *100 feet.* |

*Sliding Door, Brnzed Wr't Iron, ft. 6½c*
*Sliding Door, Iron Painted....5½@3c*
*Sliding Door, Wrought Brass, 1½ in.....lb. 36c..30%*
Cronk's Double Braced Steel Rail, ₱ foot.....8¼¢
Cronk's O. N. T. Rail.....8¼¢
Lanes' O. N. T., ₱ 100 ft., 1 inch....$2.85
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros.'.....₱ ft. 4¼¢
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard.....₱ ft. 4 ¢
Stowell's Cast Rail.....11¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, Plain....8½¢

## Rakes—

*Net Prices, Malleable Rakes:*

| *10* | *12* | *14* | *16-tooth* |
|---|---|---|---|
| *Shank.....$1.50* | *1.80* | *1.75* | *1.85* |
| *Socket....$1.65* | *1.80* | *1.95* | *2.10* |

*Sept. 1, 1900, List:*
*Cast Steel*.....70@5&2%
*Malleable*.....70@10@75@5%
*Lawn Rakes, Metal Head, per doz.,*
*10 teeth*.....*$3.25@3.50*
*14 teeth*.....*$3.60@3.75*
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 20 and 30 teeth.....
₱ doz. $4.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.60
Lawn Queen, 24-tooth, ₱ doz.....$3.75
Paragon, 20-tooth, ₱ doz.....$2.85
Paragon, 24-tooth ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$3.00
Malleable Garden, 14-tooth ₱ doz. $2.25

## Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5%
McCaffrey File Co. Horse Rasps.60&10&5%
New Nicholson Horse Rasp.....70&10%
See also *Files.*

## Razors—

Boracic.....70%
Fox Razors, No. 42...₱ doz. $20.00 } 70%
Fox Razors, No 44...₱ d z. $24.00 } off
Fox Razors, No. 82, Platina, ₱ doz $24.00 }
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%
Safety Razors.....40%

## Razor Strops—

See *Strops, Razor.*

## Reels— Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes.....25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor.50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2904N, 2904P and PN, 002904PN, 0924 and 0924N, 5009N and PN.....40&10%
Shakespeare, Style C.....25%

## Registers—

*List Sept. 3, 1901.*

*Black Jap*
*White Jap*
*Bronzed*
*Nickel Plated*
*Electro Plated*
} *60@10&5 @70&5%*

*There is a good deal of irregularity in prices of Registers, especially in Black Japanned, and some jobbers and manufacturers are using the old list.*

## Revolvers—

*Single Action*.....*$1.00@90c*
*Double Action*.....*$1.80*
*Automatic*.....*$3.10*
*Hammerless*.....*$3.60*

## Riddles, Grain or Sand—

*16 in. per doz*.....*$2.00@$2.25*
*17 in. per doz*.....*$2.25@$2.50*
*18 in. per doz*.....*$2.50@$2 75*

## Rings and Ringers—

### Bull Rings—

| | *2* | *2½* | *3 Inch.* |
|---|---|---|---|
| *Steel*..... | *$0 80* | *0.90* | *0.95 doz.* |
| *Copper*..... | *1.10* | *1.80* | *1.80 doz.* |

### Hog Rings and Ringers—

*Hill's Rings....gro. boxes, $4.00@4.50*
*Hill's Ringers, Gray Iron, doz. 50@55c*
*Hill's Ringers, Mal. Iron, doz. 75@80c*
*Blair's Rings*.....*per gro. $5.75@6.00*
*Blair's Ringers...per doz. $0.65@ .70*
*Brown's Rings....per gro. $6.00@6.25*
*Brown's Ringers..per doz. $1.00@1.10*
Rapid Rings.....₱ gro. $6.00
Rapid Ringers.....₱ doz. $3.50

## Rivets and Burrs—

*Copper*.....50@50&5%
*Iron or Steel:*
*Tinners'*.....70@70&10%
*Miscellaneous*.....70@70&10%

## Rivet Sets—See *Sets.*

## Roasting and Baking Pans—See *Pans, Roasting and Baking.*

## Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....50&10&10%
Cronk's Stay.....66⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's, Stay.....33⅓%
Stowell's Barn Door Stay...₱ doz. $1.25

## Rope—

*Manila, 7-16 in. and larger*
*lb. 13¼@13 c*
*Manila*.....*¾-inch.....lb. 13¼@13½c*
*Manila ¼ & 5-16 in.....lb. 13¼@14 c*
*Manila, Tarred Rope,*
*15 thread.....lb. 12¾@13 c*
*Manila Hay Rope.*
*Medium*.....*lb. 12¾@13 c*
*Sisal, 7-16 in. and larger lb. 8¼@ 9¼c*
*Sisal*.....*¾-inch..lb. 9 @ 9¾c*
*Sisal ¼ and 5-16 in....lb. 9¼@10¼c*
*Sisal, Hay Rope, 2 to 10 ply*.....*lb. 8¼@ 9¼c*
*Sisal, Tarred, Medium*
*Lath Yarn*.....*lb. 8¼@ 8¾c*
*Cotton Rope:*
*Best*.....*¼-in. and larger lb. 13¼c*
*Medium*.....*¼-in. and larger lb. 11 c*
*Com*.....*¼-in. and larger lb. 9 c*
*Jute Rope:*
*Thread No. 1, ¼ in. and up lb. 6½c*
*Thread No. 2, ¼-in. and up lb. 6 c*
*Yarn, ¼ in and up*.....*lb. 5 c*

### Wire Rope—

*Galvanized*.....*35c@7½¢*
*Plain*.....*30c@7½¢*

## Ropes, Hammock—

Covert Mfg. Co.....45&2%
Covert Saddlery Works.....60&5%

## Rules—

*Boxwood*.....*60@60&10%*
*Ivory*.....*35c@10@35c@10c@10%*
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

## Sad Irons—See *Irons, Sad.*

## Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

## Sash Cords—See *Cord, Sash.*

## Sash Locks—See *Locks, Sash.*

## Sash Weights—

See *Weights, Sash.*

## Sausage Stuffers or Fillers—See *Stuffers or Fillers Sausage.*

## Saw Frames—See *Frames, Saw.*

## Saw Sets—See *Sets, Saw.*

## Saw Tools—See *Tools, Saw.*

## Saws—

Atkins:
Circular.....50@50&10%
Rand.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50&10%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Disston's:
Circular Solid and Inserted Tooth.50%
Band 2 to 14 in. wide.....60%
Band ¼ to 1¾.....70%
Crosscuts.....4@45&10%
Narrow Crosscuts.....50@50&10%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....30@35&7½%
Woodsaw Blades.....40@40&7½%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 79, 77, 8.....25@25&7½%
Hand Saws, Nos 7, 107, 107½, 3, 1, 0, 00, Combination.....30@30&7½%
Compass, Keyhole, &c.....35@35&7½%
Butcher Saws and Blades..35@35&7½%
C. E. Jennings & Co.'s.:
Back Saws.....25%
Butcher Saws.....35%
Compass and Key Hole Saws.....25%
Framed Wood Saws.....40%
Hand Saws.....25@30%
Wood Saw Blades.....45%
Peace:
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Compass, Keyhole, &c.....25@25&7½%
Wood Saws.....35@35&7½%

## Hack Saws—

Disston:
Concave Blades.....25%
Keystone.....30%
Hack Saw Frames.....30%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180, 330.....40%
Hack Saws, Nos. 175, 180, 330, complete.....40%
Griffin's Hack Saw Frames.....45%
Griffin's Hack Saw Blades.....45%
Star Hack Saws and Blades.....15&10%

## Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

## Scale Beams—

See *Beams, Scale.*

## Scales—

*Family, Turnbull's*.....*30@30&10%*
*Counter:*
*Hatch, Platform, 14 oz to 1 lbs. doz $5.50*
*Two Platforms, ½ oz to 8 lbs. doz. $16*
*Union Platform, Plain..$1.70@1.90*
*Union Platform, Striped $1.35@2.15*
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Pelouze Scales—Household, Counter, Confectionery, Postal, Ice, &c.....50%
"The Standard" Portables.....45%
"The Standard" R. R. and Wagon....50%

## Scrapers—

*Box, 1 Handle*.....*doz $2.25@2.50*
*Box, 2 Handle*.....*doz. $2.75@3.00*
*Ship, No. 1, doz. $3.50; No. 2, $2.25@2.40*
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30@30&10%

## Screens, Window, and Frames—

Bonanza Window Screens.....60@60&5%
Cortland Victor Screens.....60@60&5%
Flyer Pattern Window Screen..60@60&5%
Maine Window Screen Frames.40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames.....
60&10&5%
Porter's Hummer Window Screens.....
60@60&5%
Porter's Klondike Window Screens.....
60&2½@60&7½%
Wabash Spring Adj. Screen.....50%
See also *Doors.*

## Screw Drivers—

See *Drivers, Screw.*

## Screws—Bench and Hand—

*Bench, Iron..doz. 1 in., $3.00@3.25; 1¼, $3.50@3.75; 1¼, $4.00@4.50*
*Bench, Wood, Beech..doz. $2.50@2.75*
*Hand, Wood*.....*30@5@40%*
Hand, R. Bliss Mfg Co.....35%

## Coach, Lag and Hand Rail—

*Lag, Common Point, list Oct. 1, '99*.....*75@5@..%*
*Coach and Lag, Gimlet Point, list Oct. 1, '99*.....*75@...%*
*Hand Rail, list Jan. 1, '81.60@10@...%*

## Jack Screws—

*Standard List*.....*75@75&10%*
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50@50&5%
Sargent.....70&10%

## Machine—

*List Jan. 1, '98.*
*Flat or Round Head, Iron.50@50&10%*
*Flat or Round Head, Brass50@50&10%*

## Set and Cap—

*Set (Iron or Steel)*.....*70&10&10%*
*Sq. Hd. Cap*.....*65&10&10%*
*Hex. Hd. Cap*.....*65&10&10%*
*Rd. or Fillister Hd. Cap...60&10&10%*

## Wood—

*List Jan. 1, 1900.*
*Manufacturers' printed discounts:*
*Flat Head, Iron*.....*87½@90%*
*Round Head, Iron*.....*85@87½%*
*Flat Head, Brass*.....*85@87½%*
*Round Head, Brass*.....*82½@85%*
*Flat Head, Bronze*.....*75@80%*
*Round Head, Bronze*.....*72½@77½%*
*Drive Screws*.....*87½@90%*
NOTE.—*Extra 5@10% often given.*

## Scroll Saws—See *Saws, Scroll.*

## Scythes—

*Per doz.*
*Clipper Pattern, Grass*.....*$4.25*
*Full Polished Clipper*.....*$4.75*
*Grain*.....*$7.00*
*Clipper, Grain*.....*$7.50*
*Wood and Bush*.....*$4.50*

## Scythe Snaths—

See *Snaths, Scythe.*

## Seeders— Raisin—

Enterprise.....25@30%

## Sets— Awl and Tool—

*Brad Awl and Tool Sets:*
*Wood Hdle..10 Awls doz. $2.00@2.25*
*Wood Hdle., 14 Awls, 6 Tools.....*
*doz. $2.50@2.60*
Aikan's Sets, Awl and Tools:
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool Hdls....Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior: No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30@30&10&10%

## Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe.....
₱ doz.....$9.00

## Nail—

*Square*.....*per gro. $3.50*
*Round, Blk. and Pol., assorted.....*
*gro. $1.80@2.50*
*Octagon*.....*gro. $4.25@4.75*
*Knurled. Good*.....*gro. $6.00@6.50*
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $2.00
Snell's Corruzated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

## Rivet—

*Regular list*.....*70@70&10&5%*

## Saw—

Aikan's:
Genuine.....₱ doz. $5.50@6.00
Imitation.....₱ doz. $3.00@3.10
Atkin's.:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....40&20%
Nos. 3 and 4, Cross Cut, $23....50&20&5%
No. 5, Mill, $21.00.....50&20& 0%
No. 10, $15.50.....40&20%
No. 11, $16.00.....40&20%
Taintor Positive, ₱ doz. $18.....60%

## Sharpeners Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70&5%
Tanite Mills ₱ gross, $14.40....25@33⅓%

## Sharpeners Skate—

Eureka Skate Sharpener.....₱ doz. $2.00

## Shaves, Spoke—

*Iron*.....*doz. $1 00@1.75*
*Wood*.....*doz. $1.75@2.00*
Bailey's (Stanley R. & L. Co.).....
50@50&10&10%
Goodell's, ₱ doz. $9.00.....15&10%

## Shears—

| *Cast Iron...* | *7* | *8* | *9 in.* |
|---|---|---|---|
| *Best*..... | *$16.00* | *13.00* | *$0.00 gro.* |
| *Good*..... | *$13.00* | *15.00* | *17.00 gro.* |
| *Cheap*..... | *$5.00* | *6.00* | *7.00 gro.* |

*Straight Trimmers, &c.:*
*Best quality, Jap*.....*70@70&10%*
*Nickel*.....*60@60&10%*
*Fair qual. Jap*.....*80@80&5%*
*Nickel*.....*75@75&10%*
*Tailors' Shears*.....*40@40&10%*
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge.....50%
Wilkinson's Sheep.....1900 list, 50%

## Tinners' Snips—

*Steel Blades*.....*20&10%*
*Steel Laid Blades*.....*40&10%*
Forged Handles, Steel Blades, Berlin..
40@40&10%
Jennings & Griffin Mfg. Co's. 7 to 10 inch.....50%
Niagara Snips.....40%
P. S. & W. Co.....30%

## Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00
25@25&10%
John T. Henry Mfg. Company:
Pruning Shears, all grades..40@40&5%
Orange Shears.....50&10@50&20%
Grape.....40&10@50%
Tree Pruners.....75%
Nagley's Pruning Shears.....10&5%
P., S. & W. Co.....33⅓%

## Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller Hatfield's, Sargent's list.....
75&10&10%
Reading.....70&10&75%
R. & E. list.....33⅓%
Wrightsville, Hatfield Pattern.....80%

## Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&10%&10%

## Shells— Shells, Empty—

Brass Shells, Empty:
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge..
65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Smokeless 10, 12, 16 and 20 gauge..
33⅓&10%
Blue Rival, New Climax, Primrose Club, Yellow Rival, 10, 12, 16 and 20 gauge.....15%
Climax Club, League, Rival, 14, 16 and 20 gauge ($7.50 list).....20&5%
Climax Club, League, Rival 10 and 12 gauge.....35&5%
Defiance, High Base, New Victor Nitro, Repeater, 10, 12 16 and 20 gauge.....15%
Trap and Metal Lined, 10, 12, 16 and 20 gauge.....33⅓&10&5%

## Shells, Loaded—

*Loaded with Black Powder*.....*10@5%*
*Loaded with Smokeless Powder, medium grade*.....*10@10&5%*
*Loaded with Smokeless Powder, high grade*.....*10@10@10&5%*

## Shoes, Horse, Mule, &c.—

*F. o. b., Pittsburg.*
*Iron*.....*per keg $3.00*
*Steel*.....*per keg 3.25*
Burden's, all sizes, ₱ keg.....$3.60

## Shot—

*Drop, up to B, 25-lb. bag*.....*$1.85*
*Drop, B and larger, per 25-lb. bag...*
*$1.60*
*Buck, 25-lb. bag*.....*$1.60*
*Chilled, 25 lb. bag*.....*$1.60*
*Dust Shot, 25-lb. bag*.....*$2.10*
Markle's Chilled.....$1.60
Raymond Chilled.....$1.60

## Shovels and Spades—

*Association list*.....*40%*
*Note.—Common Plain Back Shovels are generally sold by jobbers at $4.75@7.00.*

### Sieves and Sifters—

*Hunter's Imitation, gro. $11.00@11.50*
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

| 14&16 | 16&18 | 18&20 |
|---|---|---|
| $12.90 | $13.80 | $15.00 |

F. J. Meyers' Mfg. Co.:
Eclipse.....₱ gr. $11.00
Electric Light.....₱ gr. $11.00
Hunter's Genuine.....₱ gr. $12.50
No Name, Hunter's.....₱ gr. $11.00
Standard.....₱ gr. $11.00
Shaker (Barler's Pat.) Flour Sifters.
₱ doz., $2.00.....30%

### Sieves, Tin Rim—

*Per dozen*

| Mesh | 14 | 16 | 13 | 20 |
|---|---|---|---|---|
| *Black, full size* | $0 95 | .98 | 1.00 | 1.10 |
| *Plated, full size* | $1.05 | 1.08 | 1.10 | 1.20 |
| *Black, scant* | $0.78 | .80 | .80 | .83 |

### Sieves, Wooden Rim—

*Nested, 10, 11 and 12 Inch.*
*Mesh 18, Nested, doz.....$0.65@0 75*
*Mesh 20, Nested, doz..... .75@ .85*
*Mesh 24, Nested, doz..... .90@1.00*

### Sinks—

#### Cast Iron—

*Standard list.....65&10@70..%*
NOTE.—*There is not entire uniformity lists used by jobbers.*

#### Wrought Steel—

New Era, Galv'd and Enameled...70&5%
New Era, Painted.....50&10%
L. & G. Mfg. Co., Galvanized.....50%
L. & G. Mfg Co. Enameled.....50%

### Skeins, Wagon—

*Cast Iron.....70&10@75%*
*Malleable Iron.....40&10@50%*
*Steel.....40@40&10%*

### Slates—

*Factory Shipments.*
*"D" Slates.....50&10&10&10%*
*Unexcelled, etc., Noiseless Slates.60 & 8 tens %*
*Victoria, etc., Noiseless Slates..60& 7 tens &5%*
*Wire Bound.....50&10&5%*
*Web Hinge.....5%*

### Slaw Cutters—See *Cutters.*

### Slicers, Vegetable—

Sterling $ 2.00.....33⅓

### Snaps, Harness—

*German.....40@40&10%*
Covert Mfg. Co.:
Deroy.....35&2%
High Grade.....45&2%
Jockey.....40&2%
Trojan.....45&2%
Yankee.....35&2%
Yankee, Roller.....30&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
W. & E. T. Fitch Co.:
Bristol.....40&10%
Empire.....50&5%
German.....40%
National.....50&5%
Perfect.....40%
Clipper.....50&5%
Champion.....40%
Security.....40%
Victor.....60&5%
Oneida Community:
Solid Steel.....65@65&10%
Solid Swivel.....65&10@65&10&10%
Sargent's Patent Guarded.....66⅔&10%

### Snaths—

*Scythe.....50@50&10%*

### Snips, Tinners'—See *Shears.*

### Soldering Irons—

See *Irons, Soldering.*

### Spoke Trimmers—

See *Trimmers, Spoke.*

### Spoons and Forks—

#### Silver Plated—

*Good Quality.....60&10@60&10&5%*
*Cheap.....60@60&10%*
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....5&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 17 Silver Plated Ware.....60&10%

#### Miscellaneous—

*German Silver.....60&10@60&10&10%*
Simeon L. & Geo H. Rogers Co.:
German or Nickel Silver, Special list L. & 10%

#### Tinned Iron—

*Teas.....per gro. 45@5.c*
*Tables.....per gro. 90c@$1.00*

### Springs—

#### Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in....₱ doz. $1.10@1.25
Victor (Coil).....50&10&10%

#### Carriage, Wagon, &c.

*¾ in. and Wider:*
*Black or ⅛ Bright, lb.....4¼c*
*Bright, lb.....5¼c*
*Painted Seat Springs:*
*1½ x2x 26 and smaller, per pr 48@53c*
*1½ x 2 x 28 per pr.....55@61c*
*1½ x 3 x 28 and narrower, per pr. 75@80c*
Cliff's Springs:
Bolster.....40%
Seat.....per pair, 50¢
Pole..per pair, ¾ in. $1.10; ¾ in. $1.25

### Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

### Squares—

*Nickel plated....* } *List Jan. 5, 1900*
*Steel and Iron...* }.....70¢10@75%
*Rosewood Hdl Try Square and T-Bevels.....60¢10¢10@70%*
*Iron Hdl. Try Squares and T-Bevels. 40¢10@40¢10¢10%*
Disston's Try Sq. and T-Bevels.....60&10%
Winterbottom's Try and Miter..... 40&10@40&10&10%

### Squeezers—

#### Lemon—

*Wood, Common, gro., No. 0, $5.25 @$5.50; No. 1, $6.25@$6.50.*
*Wood, Porcelain Lined:*
*Cheap.....doz. $2.00@2.75*
*Good Grade.....doz. $3.00@3.50*
*Tinned Iron.....doz. $0.75@1.25*
*Iron, Porcelain Lined doz. $2.90@3.25*
Jennings' Star.....₱ doz. $1.85@1.90

### Staples—

*Barbed Blind.....lb. 6@6¼c*
*Electricians', Association list..... 80¢10&10&10%*
*Fence Staples, same price as Barbed Wire. See Trade Report.*
*Poultry Netting, Staples....per lb.. 3¼@3½c*
Grand Crossing Tack Co.'s list....80&10%

### Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
Hartzell Cutlery Co.....60&5%
C. & A. Hoffmann's.....40%

### Steelyards.....35@25&10%

### Stocks and Dies—

*Blacksmiths'.....40@40¢10%*
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%
Curtis Reversible Ratchet Die Stock.25%

### Stone—

#### Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $3.00 per gro., 12 inch, $10..)
Pike Mfg. Co. 1901 list:

| | ₱ gro. |
|---|---|
| Black Diamond S. S.... | $12.00 |
| Lamoille S. S. | $11.00 |
| White Mountain S. S.... | $9.00 |
| Green Mountain S. S.... | $6.00 |
| Extra Indian Pond S. S. | $7.50 |
| No. 1 Indian Pond S. S. | $7.00 |
| No. 2 Indian Pond S. S. | $4.50 |
| Leader Red End S. S.... | $4.50 |
| Balance of 1901 list 33⅓% | |

#### Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

| | ₱ D. |
|---|---|
| Arkansas Stone, No. 1, 8 to 5¼ in. | $2.80 |
| Arkansas Stone, No. 1, 5¼ to 8 in. | $3.50 |
| Arkansas Slips No. 1 | $4.00 |
| Lily White Washita 4 to 8 in. | 60¢ |
| Rosy Red Washita 4 to 8 in | 60¢ |
| Washita Stone, Extra, 4 to 8 in. | 50¢ |
| Washita Stone, No. 1, 4 to 8 in. | 40¢ |
| Washita Stone, No. 2, 4 to 8 in. | 30¢ |
| Lily White Slips | 90¢ |
| Rosy Red Slips | 90¢ |
| Washita Slips, Extra | 80¢ |
| Washita Slips, No. 1 | 70¢ |
| India Oil Stones (entire list) | 25% |
| Hindostan No. 1, Regular | ₱ D 80¢ |
| Hindostan No. 1 Small | ₱ D 10¢ |
| Axe Stones (all kinds) | 33⅓% |
| Turkey Oil Stones, ex. 5 oz. in. | ₱ D 80¢ |
| Queer Creek Stones, 4 to 8 in. | 20¢ |
| Queer Creek Slips | 10¢ |
| Sand Stone | 5¢ 40% |
| Belgian, German and Swaty Razor Hones | 40% |
| Natural Grit Carving Knife Hones, ₱ doz | $3.00 |
| Quick Edge Pocket Knife Hones, ₱ doz | $3.00 |
| Mounted Kitchen Sand Stone, ₱ doz | $1.20 |

Tanite Mills:
Emery Oil, ₱ doz. $5.00.....50@60%

### Stoners—

#### Cherry—

Enterprise.....25@30%

### Stops, Bench—

Milliers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00..50&20%
Morrill's, No. 2, $11.00.....50&10%

### Stops, Window—

Ives' Patent.....25&5%

### Stove Boards—

See *Boards, Stove.*

### Stove Polish—See *Polish, Stove.*

### Strainers, Pump—

Diamond Joe Pump Strainers..per doz. 75¢

### Straps, Box—

Cary's Universal case lots.....20&10%

### Stretchers, Carpet—

*Cast Iron, Steel Points...doz. 55@65c*
*Socket.....doz. $1.75*

### Strops, Razor—

Smith & Hemenway Co.....70%

### Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

### Tacks Brads, &c.—

*List Jan. 15, '99.*
*Carpet Tacks, American 90¢25@....%*
*American Cut Tacks....90¢20@....%*
*Swedes Iron Tacks.....90¢30@....%*
*Swedes Upholsterers' Tacks..... 90¢40@....%*
*Gimp Tacks.....90¢50@....%*
*Lace Tacks.....90¢40@....%*
*Trimmers' Tacks.....90¢25@....%*
*Looking Glass Tacks.....70¢10%*
*Bill Posters' and Railroad Tack.... 90¢40@....%*
*Hungarian Nails.....80¢15%*
*Common and Patent Brads.....80¢10%*
*Trunk and Clout Nails.....80¢5%*

NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10¢5% on Standard Weights.****

#### Miscellaneous—

*Double Point Tacks....90¢6 or 7 tens*
*Steel Wire Brads, R. & E. Mfg. Co.'s list.....50¢10@60%*
See also *Nails, Wire.*

### Tanks, Oil—

Emerald, S. S. & Co.....30-gal. $3.20
Emerald, S. S. & Co.....60-gal., $4.00
Queen City S. S. & Co., 30-gal.....$3.50
Queen City S. S. & Co., 60-gal.....$4.25

### Tapes, Measuring—

*American Asses' Skin.....40¢10@50%*
*Patent Leather.....65@30¢5%*
*Steel.....40@40¢5%*
Chesterman's.....25@25¢5%
Eddy's Steel.....40@40&5%
Eddy's Metallic.....33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30@30&5%

### Teeth Harrow—

*Steel Harrow Teeth, plain or headed, base per lb.....2¼c*

### Thermometers—

*Tin Case.....80¢10@30¢10¢5%*

### Ties, Bale—Steel.

*Standard Wire.....50¢10¢5%*

### Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6¼ in. ₱ 1000..$10.00
Galv. Steel 5-32 x 8¼ in. ₱ 1000..$11.00
Galv. Steel 5-32 x 11¼ in. ₱ 1000..$12.00
Galv. Steel 5 32 x 15½ in. ₱ 1000..$14.00

### Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

### Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

### Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

### Tobacco Cutters—

See *Cutters, Tobacco.*

### Tools—Coopers'—

L. & I. J. White.....20@20&5%

#### Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

#### Ship—

L. & I. J. White.....25%

### Transom Lifters—

See *Lifters, Transom.*

### Traps—Fly—

*Balloon, Globe or Acme..... doz. $1.15@1.25; gro. $10.50@11.00*
*Harper, Champion or Paragon.... doz. $1.25@1.50; gro. $12.00@13 50*

#### Game—

*Oneida Pattern.....75¢10¢5@80¢5%*
Newhouse.....45@45&5%
Hawley & Norton.....65&5@65&10%
Victor (Oneida Pattern).....75@75&5%
Star (Blake Pattern).....60&5@60&10%

#### Mouse and Rat—

*Mouse, Wood, Choker, doz. holes.... 8½@9c*
*Mouse, Round or Square Wire..... doz. $0.85@1.00*
American Pattern French Rat and Mouse Traps—
No. 1, Detroit Marty Pattern, ₱ doz. $4.50; in ⅛ gro. lots, ₱ doz.....$4.00
No. 2, Detroit Marty Pattern, ₱ doz. $3.25; in ⅛ gro. lots, ₱ doz.....$3.00
Detroit Marty Pattern Mouse, ₱ doz. $2.00; in ⅛ gro. lots. ₱ doz.... $1.75
Diamond Joe Mouse Traps....per doz. 60¢
Diamond Joe Rat Traps..... per doz. $1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 72 $2.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00; No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00.....50%

#### Target—

Markle's, each.....$5.50

### Trimmers, Spoke—

Bonney's Nos. 1 and 2.....40%

### Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....40%
Never-Break Steel Garden Trowels.... gro. $7.00
Peace's Plastering.....30%
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Pl'st'ring.....25%

### Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....50%
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks.....₱ doz. $18.50

### Tubs, Wash—

| | No. 1 | 2 | 3 |
|---|---|---|---|
| *Galvanized, per doz.* | *$5.00* | *5 50* | *6.00* |
| Galvanized Wash Tubs (S. S. & Co.): No. | 1 | 2 | 3 |
| Per doz. | $5 25 | 6.00 | 6.75 |
| | 8 | 10 | 20 |
| | 6.30 | 7 25 | 8.00 |

### Twine—

#### Miscellaneous—

| *Flax Twine—* | *BC* | *B.* |
|---|---|---|
| *No. 9, ¼ and ½-lb. Balls..* | *22c* | *24c* |
| *No. 12, ¼ and ½-lb. balls..* | *18c* | *20c* |
| *No. 18, ¼ and ½-lb. Balls..* | *16c* | *18c* |
| *No. 24, ¼ and ½-lb. Balls* | *15½c* | *17½c* |
| *No. 36, ¼ and ½-lb. Balls..* | *15c* | *17c* |
| *Chalk Line, Cotton, ½-lb Balls....* | | *22@22½c* |
| *Cotton Mops, 6, 9, 12 and 15 lb. to doz.....7@8c* | | |
| *Cotton Wrapping, 5 Balls to lb.... according to quality. ..10½c@17c* | | |
| *American 3-Ply Hemp, ¼ and ½-lb. Balls.....13@14c* | | |
| *American 3 Ply Hemp, 1-lb. Balls.. 15@16c* | | |
| *India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....8c* | | |
| *India 3-Ply Hemp, 1-lb. Balls.....8c* | | |
| *India 3-Ply Hemp, 1½-lb. Balls.... 7c* | | |
| *2, 3, 4 and 5-Ply Jute, ½-lb. Balls... 9@10c* | | |
| *Mason Line, Linen, ½-lb. Balls...15c* | | |
| *No. 2½ Mattress, ¼ and ½-lb. Balls.37c* | | |
| *Wool, 3 to 6 ply.....5c* | | |

### Vises—

*Solid Box.....50@50&10%*

#### Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Beaney's.....40%
Columbian Hdw. Co.....40%
Fisher & Norris Double Screw....15&10%
Hollands':
Machinists'.....40%
Keystone.....65&5%
Lewis Tool Co.....20@30%
Massey's Perfect.....15@20%
Massey's:
Clincher.....50@40%
Combination, Quick Adj.....40%
Woodworker's.....15@20%
Merrill's.....20%
Miller's Falls.....50&10&10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....40%
Snedliker's X. L.....20@25%
Stephens'.....20@25%

### Saw Filers—

Bonney's, No. 1, $13; No. 3, $16.....50%
Disston's D 3 Clamp and Guide, ₱ doz. $30.....25%
Reading.....60%
Wentworth's Rubber Jaw, Nos. 1 2 and 3.....45&50%

### Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60%

Parker's Combination Pipe:
87 Series.....60%
187 Serels.....60&5%
No. 870.....40%

### Wads—Price Per M.

| | |
|---|---|
| *B. E., 11 up* | *60c* |
| *B. E., 9 and 10* | *70c* |
| *B. E., 8* | *80c* |
| *B. E., 7* | *80c* |
| *P. E., 11 up* | *$1.00* |
| *P. E., 9 and 10* | *1.25* |
| *P. E., 8* | *1.50* |
| *P. E., 7* | *1.50* |
| *Ely's B. E., 11 and larger* | *$1.70@1.75* |
| *Ely's P. E., 12 to 20* | *$3.00@3.25* |

*Dis. 30&5%*

### Wagon Jacks—

See *Jacks, Wagon.*

### Ware, Hollow—

Aluminum—
S. S. & Co. Reduced List.....40%

#### Cast Iron, Hollow—

*Stove Hollow Ware:*
*Ground.....65%*
*Unground.....70%*
*White Enameled Ware:*
*Maslin Kettles.....75¢10¢5@80%*
*Covered Ware:*
*Tinned and Turned.....*
*40¢10@10&10¢5%*
*Enameled and Plain.50@50¢10¢5%*
See also *Pots, Glue.*

#### Enameled—

Agate Nickel Steel Ware, list Nov. 1, '01.....50&20%
Iron Clad Ware.....70&10%
Never Break Enameled....50&5@50&10%

#### Tea Kettles—

*Galvanized Tea Kettles:*

| *Inch* | *6* | *7* | *8* | *9* |
|---|---|---|---|---|
| *Each* | *45c* | *50c* | *55c* | *65c* |

#### Steel Hollow Ware.

Avery Spiders & Griddles.....65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles..... 65&5%
Never Break Kettles.....60%
Solid Steel Spiders & Griddles....65&5%
Solid Steel Kettles.....60%
Solid Steel Ware, Enameled.....50&5%

### Washboards—

Solid Zinc: ₱ doz
Crescent, family size, bent frame..$3.00
Red Star, family size, stationary protector.....$3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.65
Cable Cross, family size, stationary protector.....$2.90
Single Zinc Surface:
Salad, family size, open back perforated.....$2.40
Saginaw Globe, protector, family size, ventilated back.....$2.25

Brass Surface:
brass King, Single Surface, open back ..... $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

### Washers—
### Leather, Axle—

*Solid*.....85¢10¢10@85¢10¢10¢10%
*Patent*.....85¢10@85¢20%
*Coil:* ⅜ 1 1⅛ 1¼ Inch.
10c 11c 15c 18c per 100

### Iron or Steel—

*Size bolt*.... 5-16 ⅜ ½ ⅝ ¾
*Washers*....$5.10 4.30 2.90 2.70 2.50
*In lots less than one keg add ¼c per lb., 5-lb. boxes add ½c to list.*

### Cast Washers—

*Over ½ inch, barrel lots, per lb*.....
1⅛@1¾c

### Washer Cutters—
See *Cutters, Washer.*

### Washing Machines—
See *Machines, Washing.*

### Water Coolers—
See *Coolers, Water.*

### Wedges—
*Oil Finish*.....lb. $.90@$.10c

### Weights, Sash—
*Per ton, f.o.b. factory*....$21.00@22.00

*Some Foundries make price $1@$2 lower.*

### Well Buckets, Galvanized
See *Pails, Galvanized.*

### Wheels Well—
*8-in., $1.45@1.65; 10-in., $1.75@2.00; 12-in., $2.36@2.50; 14-in., $3.50@3.75*

### Wire and Wire Goods—
*Bright and Annealed:*
6 to 9.....72½c5@72½c10%
10 to 18.....72½c10@72½c10c5%
19 to 26.....75c10c3½@75c10c7½%
27 to 36.....75c10c7½@80c3½%
*Galvanized:*
6 to 18.....70@70c5%
19 to 26.....72½c5@72½c10%
27 to 36.....72½c10@72½c10c5%
*Coppered:*
6 to 9.....70c5@70c10%
10 to 18.....70c10@70c10c5%
19 to 26.....75c7½@75c10c3½%
27 to 36.....75c10@75c10c5%
*Tinned:*
6 to 14.....75@75c7½%
15 to 18.....72½c5@75%
19 to 26.....70c5@70c5c5%
27 to 36.....70@70c5%
*Annealed Wire on Spools*..70c5@70c10%

*Brass and Copper Wire on Spools*..
60c5@60c10%
*Brass, list Feb. 26, '98*.....25%
*Copper, list Feb. 26, '96*.....15%
*Cast Steel Wire*.....50%
*Stubs' Steel Wire*.....$6.00 to 2. 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

### Bright Wire Goods—
*List April 1, 1901*.....85c10%

### Wire Cloth and Netting—
*Galvanized Wire Netting*..80c20@..%
*Painted Screen Cloth per 100 ft*..$1.00
*Light Hardware Grade:*
2-18 Mesh, Plain (8c. list) sq. ft.. 1⅛@1¼c
2-18 Mesh, Galv. (8c. list) sq. ft... 2½@2¾c

### Wire, Barb—See *Trade Report.*

### Wire Rope—See *Rope, Wire.*

### Wrenches—
*Agricultural*.....70c10@75c10%
*Case Lots*.....75c10%
Acme.....60c10%
Alligator.....70%
Baxter's S.....60c10%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....35&5%
Adjustable S Pipe.....10%
Brige's Pattern.....30&10%
Combination Black.....40&5%
Combination Bright.....40%
Cylinder or Gas Pipe.....55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Bindley Automatic.....30%
Boardman's.....33⅓%
Coes' Genuine.....40&10&5&5%
Coes' "Mechanics'".....40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle.....50&10%
Elgin Wrenches.....40%
Elgin Monkey Wrench Pipe Jaws...33⅓%
Gem Pocket.....30%
Hercules.....70%
Knife Handle, Machinists' (W. & B.):
Case lots.....50&10%
Less than case lots.....50&5%
Improved Pipe (W. & B.).....5%
Solid Handles, P. S. & W.....50@50&10%
Stillson.....65
Triumph.....60&10%

### Wrought Goods—
*Staples, Hooks, &c., list March 17 '98*.....90@90c10%

### Yokes Neck—
Covert Saddlery Works, Trimmed.60&5%
Covert Saddlery Works, Neck Yoke Centers.....70%

### Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters'.. list net

### Zinc—
*Sheet*.....lb 6¼c@6¾c

## PAINTS, OILS AND COLORS—Wholesale Prices.

### White Lead, Zinc, &c.

Lead, English white, in Oil..... @ 9¼
Lead, American White, in Oil:
Lots of 500 ℔ or over..... @ 6
Lots less than 500 ℔..... @ 6¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price..... @ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.. @ 1¼
Lead White, Dry in bbls..... 5½@ 6
Lead, American, Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry..... ℔ ℔ 4¾@ 4¾
Zinc, Paris, Red Seal, dry..... @ 8¾
Zinc, Paris, Green Seal, dry..... @ 9¼
Zinc, Antwerp Red Seal, dry..... @ 6¾
Zinc, Antwerp, Green Seal, dry .. @ 8
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over.....12 @12½
Lots of less than 1 ton.....12½@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over.....10¾@11¼
Lots of less than 1 ton.....11@11¾
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

### Dry Colors.

Black, Carbon..... ℔ ℔ 8 @20
Black, Drop, Amer..... 4 @ 7
Black, Drop, Eng..... 7 @11
Black, Ivory..... 12 @21
Lamp, Com..... 4½@ 6
Blue, Celestial..... ℔ ℔ 4 @ 6
Blue, Chinese..... 30 @35
Blue, Prussian..... 28 @34
Blue, Ultramarine..... 4 @20
Brown, Spanish..... ½@ 1
Brown, Vandyke, Amer..... 1¾@ 2¼
Brown, Vandyke, Foreign..... 2¼@ 3½
Carmine, No. 40..... ℔ ℔ 2.05@2.75
Green, Chrome, ordinary..... 5 @ 6¼
Green, Chrome, pure..... 16 @20
Lead, ited, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over..... @ 5¼
Lots less than 500 ℔..... @ 6
Litharge, bbls. ¼ bbls. and kegs:
Lots 500 ℔ or over..... @ 5¼
Lots less than 500 ℔..... @ 6
Ocher, French Washed..... 1¾@ 1¾
Ocher, Dutch Washed..... 4¾@ 5
Ocher, American.... ℔ ton $10.00@15.00
Orange Mineral, English.. ℔ ℔ 8½@11½
Orange Mineral, French..... 11 3-16@11½
Orange Mineral, German..... 8½@10¾
Orange Mineral, American .... 8 @ 8¾
Red, Indian, English..... 4½@ 8½
Red, Indian, American..... 3 @ 3¼
Red, Turkey, English..... 4 @ 6
Red, Tuscan, English..... 7 @10
Red, Venetian, Amer.. ℔ 100 ℔. 80@1.75
Red Venetian, English. ℔ 100 ℔ 1.80@3.00
Sienna, Italian, Burnt and Powdered..... ℔ ℔ 3½@ 7½
Sienna, Ital., Raw, Powd..... 3½@ 7½
Sienna, American, Raw..... 1½@ 2
Sienna, American, Burnt and Powdered..... ℔ ℔ 1½@ 3
Talc, French..... ℔ 100 ℔ $1.25 @4.50
Talc, American..... .90 @1.10
Terra Alba, French, ℔ 100 ℔ .95 @1.00
Terra Alba, English..... .95 @1.00
Terra Alba, American No. 1.....65 @85
Terra Alba, American No. 2.....45 @50
Umber, Turkey, Bnt.& Pow. ℔ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer..... 1½@ 2
Umber, Raw, Amer..... 1½@ 2
Yellow, Chrome..... 10½@25
Vermilion, American Lead.....10 @40
Vermilion, Quicksilver, bulk ... @70
Vermilion, Quicksilver, bags... @71
Vermilion, English, Import... 80 @93
Vermilion, Chinese.... .$1.05@1.20

### Colors in Oil.

Black, Lampblack..... 12 @14
Blue, Chinese..... 36 @40
Blue, Prussian..... 32 @38
Blue, Ultramarine..... 13 @16
Brown, Vandyke..... 9½@13
Green, Chrome..... 10 @12
Green, Paris..... @24
Sienna, Raw..... 10 @13
Sienna, Burnt..... 10 @13
Umber, Raw..... 9½@12
Umber, Burnt..... 9½@12

### Miscellaneous.

Barytes, Foreign, ℔ ton....$19.00@21.00
Barytes, Amer. floated..... 19.00@20.00
Barytes, Crude, No. 1..... 9.00@10.00
Chalk, in bulk..... ℔ ton 2.50@ 2.60
Chalk, in bbls ..... ℔ 100 ℔ ..@ .35
China Clay, English.. ℔ ton 13.00@17.50
Cobalt, Oxide..... ℔ 100 ℔ 2.25@ 2.50
Whiting, Common. ℔ 100 ℔ .40@ .60
Whiting, Gilders..... .45½@ .55
Whiting, extra Gilders'.... .55@ .58

### Putty.

In bladders .....$2.25
In bulk..... 1.35
In cans 1 ℔ to 5 ℔..... 3.25
In cans 12 ℔ to 25 ℔..... 2.25

### Spirits Turpentine.

In Southern bbls..... 39½@40
In machine bbls..... 40 @40½

### Glue.

Cabinet .....11½@16
Extra White..... 18 @23
French..... 12 @40
Irish..... 13½@16
Low Grade..... ℔ ℔ 9 @12
Medium White..... 14½@16½

### Animal, Fish and Vegetable Oils.

Linseed, City, raw..... ℔ gal..57 @58
Linseed, City, boiled..... 59 @60
Linseed, State and West'n, raw.56 @57
Linseed, raw Calcutta seed..... @85
Lard, Prime..... 79 @82
Lard, Extra No. 1..... .55 @56
Lard, No. 1..... .47 @48
Cotton-seed, Crude..... @ ..
Cotton-seed, Summer Yellow, prime..... 41 @42
Cotton-seed Summer Yellow, off grades..... 40 @40½
Sperm, Crude..... @ ..
Sperm, Natural Spring..... 60 @61
Sperm, Bleached Spring..... @ ..
Sperm, Natural Winter..... 75 @77
Sperm, Bleached Winter..... 78 @80
Tallow, Prime..... 04 @04
Whale, Crude..... @ ..
Whale, Natural Winter..... 46 @47
Whale, Bleached Winter..... 48 @49
Menhaden, Crude, Sound..... @ ..
Menhaden, Light Strained..... 32 @34
Menhaden, Bleached Winter...31 @35
Menhaden, Ex Bleached Winter36 @37
Cocoanut, Ceylon..... 8 @ 8¼
Cocoanut, Cochin..... 8½@ 8¾
Cod, Domestic..... 33 @34
Cod, Newfoundland..... 35 @40
Red Elaine..... @42
Red Saponified..... ℔ ℔ 6¼@ 6½
Olive, Italian, bbls..... 57 @ 60
Neatsfoot, prime..... 53 @54
Palm, prime, Lagos..... ℔ ℔ 6 @ ..

### Mineral Oils.

Black, 20 gravity, 25@30 cold test..... ℔ gal. 9¾@ 10¼
Black, 29 gravity, 15 cold test. 10¼@ 11¼
Black, summer..... 9¼@ 9¾
Cylinder, light filtered..... 14¾@17¾
Cylinder, dark filtered..... 11¼@15¾
Paraffine, 903-907 gravity..... 12¾@12¾
Paraffine, 903 gravity.. ..... 11¼@11¾
Paraffine, 883 gravity..... 9¾@10
Paraffine, red, No. 1..... 12¼@12¾
In small lots ¼@ advance.


# THE IRON AGE.

*The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.*

RATES OF SUBSCRIPTION: INCLUDING POSTAGE.
UNITED STATES, BRITISH AMERICA, MEXICO, HAWAII, CUBA, PHILIPPINE ISLANDS.

**Regular Edition,** Issued every THURSDAY morning, - - - - - - - - - $5.00 a year
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**Dollar Edition,** large number FIRST THURSDAY of every month, Bulletin number each intervening Thursday, - - 1.00 "

OTHER COUNTRIES: Regular Edition, $5.00; Two Dollar Edition, $2.50; One Dollar Edition, $1.25.

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ONE YEAR, - - - - - - - - - 75.00
Rates for larger spaces quoted on application.

New York (Main Office), 232-238 William Street, - - - - - - - DAVID WILLIAMS CO., Pub'rs
Philadelphia, - - - - - Forrest Building, 117 119 South Fourth Street, - - THOMAS HOBSON, Manager.
Pittsburgh, - - - - - - Hamilton Building, 335-337 Fifth Avenue, - - ROBERT A. WALKER, Manager.
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LONDON OFFICE: Hastings House, Norfolk Street, Strand.
AUSTRALIAN OFFICES: Melbourne, Hardware Chambers, 231 Elizabeth Street; Sydney, Palings Building.

*Remittances* should be made by draft, payable to the order of DAVID WILLIAMS COMPANY, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.
*Newsdealers or Ecbstellers* in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.: The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

# CURRENT METAL PRICES.

## JANUARY 8, 1902.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

### IRON AND STEEL—

#### Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ lb; Square, 0.8¢ ₩ lb
1 to 1¾ in. round and square ..... } ₩ lb 1.90@2.00¢
1¼ to 4 in. x ⅝ to 1 in..... .....
Refined Iron:
1 to 1¾ in. round and square..... } ₩ lb 1.95@2.05¢
1¼ to 4 in. x ⅜ to 1 in..... }
1¼ to 4 in. x ¼ to 5-16..... ₩ lb 2.05@2.15¢
Rods—⅜ and 11-16 round and square. ₩ lb 2.25@2.35¢
Angles: Cts ₩ lb
3 in. x ¼ in. and larger..... 2.50¢
3 to 3½ in. x 3-16 in..... 2.50¢
1¼ to 3 in. x ¼ in ..... 2.50¢
1¼ to 2¾ in. x 3-16 in and thicker.... .2.20@2.30¢
1 to 1¼ in. x 3-16 in..... 2.30@2.40¢
1 to 1¼ x ¼ in..... 2.40@2.50¢
⅞ x ¼ in..... 2.60¢
⅝ x ⅛ in..... 2.75¢
⅝ x 1/16 in..... 3.50¢
½ x 3-32 in..... 4.50¢
Tees:
1 in..... 2.80¢
1¼ in..... 2.60¢
1¼ in, and larger..... 2.50¢
Beams..... 2.50@3.00¢
Channels, 3 in. and larger..... 2.50@3.00¢
Bands—1¼ to 6 x 3-16 to No. 8..... ₩ lb 2.30¢
"Burden's Best" Iron, base price..... ₩ lb 3.15¢
Burden's "H. B & S. Iron, base price..... ₩ lb 2.95¢
"Ulster"..... ₩ lb 3.60¢
Norway Bars..... 3.75@4.25¢
Norway Shapes..... 4.00@4.50¢

#### Merchant Steel from Store—

per lb
Bessemer Machinery..... ...1.90 to 1.95¢
Toe Calk, Tire and Sleigh Shoe..... 2.00@2.50¢
Best Cast Steel, base price in small lots..... 7½¢
Best Cast Steel Machinery, base price in small lots..... 6 ¢

#### Soft Steel Sheets—

| | | | |
|---|---|---|---|
| ¼ inch..... | 2.20¢ | No. 14..... | 3.00¢ |
| 3-16 inch..... | 2.30¢ | No 16..... | 3.20¢ |
| No. 8..... | 2.40¢ | No. 18..... | 3.40¢ |
| No. 10..... | 2.60¢ | No. 20..... | 3.70¢ |
| No. 12..... | 2.90¢ | No. 22..... | 3.80¢ |

#### Sheet Iron from Store.

##### Black.

| | One Pass, C. R. Soft Steel. | R. G. Cleaned. |
|---|---|---|
| Nos. 14 to 16..... | ₩ lb, 3.60..... | 3.55¢ |
| Nos. 18 to 21..... | ₩ lb, 3.70..... | 3.75¢ |
| Nos. 22 to 24..... | ₩ lb, 3.80..... | 3.85¢ |
| Nos. 25 and 26..... | ₩ lb, 3.90..... | 3.95¢ |
| No. 27..... | ₩ lb, 4.00..... | 4.05¢ |
| No. 28..... | ₩ lb, 4.10..... | 4.15¢ |

#### Russia, Planished, &c.

Genuine Russia, according to assortment..... ₩ lb 11@14¢
Patent Planished..... ₩ lb A, 12¢; B, 11¢, net.

#### Galvanized.

| | B. B. |
|---|---|
| Nos. 10 to 16..... | ₩ lb, 13¢ |
| Nos. 17 to 21..... | ₩ lb, 13¢ |
| Nos. 22 to 24..... | ₩ lb, 14¢ |
| Nos. 25 to 26..... | ₩ lb, 15¢ |
| No. 27..... | ₩ lb, 16¢ |
| No. 28..... | ₩ lb, 17¢ |
| No. 29..... | ₩ lb, 19¢ |
| No. 30..... | ₩ lb, 21¢ |

66⅔% off.

26 in. 1¢ ₩ lb higher.

#### Foreign Steel from Store—

Best Cast..... ₩ lb 15 ¢
Extra Cast..... ₩ lb 18 @ 20 ¢
Swaged, Cast..... ₩ lb 16 ¢
Best Double Shear..... ₩ lb 15 ¢
Blister, 1st quality..... ₩ lb 13 ¢
German Steel, Best..... ₩ lb 10 ¢
2d quality..... ₩ lb 9 ¢
3d quality..... ₩ lb 8 ¢
Sheet Cast Steel, 1st quality..... ₩ lb 15 ¢
2d quality..... ₩ lb 14 ¢
3d quality..... ₩ lb 12 ¢
R. Mushet's "Special"..... ₩ lb 46 ¢
" " " Annealed..... ₩ lb 75 ¢
" " "Titanic"..... ₩ lb 19 ¢
Hobson's Choice XX Extra Best..... ₩ lb 85 ¢
Jessop Self Hardening..... ₩ lb 45 ¢
Seamans' "Nelson" Steel..... 40 ¢
Hobson's "Soho" Special Self-Hardening.. ₩ lb 43 ¢

### METALS—

#### Tin—

| Duty.—Pigs, Bars and Block. Free. | Per lb |
|---|---|
| Banca, Pigs..... | 24¼@24⅜¢ |
| Straits, Pigs..... | 24¼@24⅜¢ |
| Straits in Bars..... | 25¼@25⅜¢ |

#### Tin Plates—

##### American Charcoal Plates.

Calland Grade:
IC, 14 x 20..... $7.25
IX, 14 x 20..... 8.75
Melyn Grade:
IC, 14 x 20..... 6.75
IX, 14 x 20..... 8.25
Allaway Grade:
IC, 14 x 20..... 6.25
IX, 14 x 20..... 7.35

##### American Coke Plates—Bessemer—

IC, 14 x 20 .....108 lb..... $5.00@5.25
IX, 14 x 20..... 6.00@6.25

##### American Terne Plates—

IC, 20 x 28..... $10.00
IX, 20 x 28..... $12.00

#### Tin Boiler Plates, American—

| | | |
|---|---|---|
| XX, 14 x 20..... | 112 sheets..... | $12.50 |
| XX, 14 x 28..... | 112 sheets..... | 13.50 |
| XX, 14 x 31..... | 112 sheets..... | 15.00 |

#### Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

##### Ingot—

Lake..... 13 @13½¢
Casting..... 12¾@13 ¢

#### Sheet and Bolt—

January 2, 1902. Net.

Prices, in cents per pound. Sheet 30 x 60.

| Not wider than | Not longer than | And longer than | 64 oz. & over, gilb. sheet, 30 x 60 and heavier. | 32 oz. to 64 oz. 25 to 30 lb. | 24 oz., to 32 oz. 18¾ to 25 lb. | 16 oz. to 24 oz. 12½ to 18¾ lb. | 14 oz. and 15 oz. 11 to 12½ lb. | 12 oz. and 13 oz. 9⅝ to 11 lb. | 10 oz. and 11 oz. 7¾ to 9⅝ lb. | 8 oz. and 9 oz. 6¼ to 7¾ lb. | Lighter than 8 oz. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ins. | Ins. | Ins. | | | | | | | | | |
| 30 | 72 | ..... | 18 | 18 | 18 | 18 | 19 | 20 | 21 | 24 | 27 |
| 30 | 96 | 72 | 18 | 18 | 18 | 18 | 19 | 21 | 24 | 27 | |
| 30 | ..... | 96 | 18 | 18 | 18 | 18 | 20 | 24 | | | |
| 36 | 72 | ..... | 18 | 18 | 18 | 18 | 20 | 22 | 25 | 28 | |
| 36 | 96 | 72 | 18 | 18 | 18 | 18 | 20 | 24 | 27 | | |
| 36 | 120 | 96 | 18 | 18 | 18 | 19 | 21 | | | | |
| 36 | ..... | 120 | 18 | 18 | 19 | 20 | | | | | |
| 42 | 72 | ..... | 18 | 18 | 19 | 20 | 22 | 25 | 28 | | |
| 42 | 96 | 72 | 18 | 18 | 19 | 21 | 23 | 26 | | | |
| 42 | 120 | 96 | 18 | 18 | 20 | 22 | 26 | | | | |
| 42 | ..... | 120 | 18 | 19 | 21 | 24 | | | | | |
| 60 | 72 | ..... | 18 | 18 | 19 | 21 | 24 | 29 | | | |
| 60 | 96 | 72 | 18 | 18 | 20 | 22 | 27 | | | | |
| 60 | 120 | 96 | 18 | 19 | 21 | 24 | | | | | |
| 60 | ..... | 120 | 19 | 20 | 22 | 26 | | | | | |
| 72 | 96 | ..... | 18 | 19 | 21 | 26 | | | | | |
| 72 | 120 | 96 | 18 | 20 | 23 | 28 | | | | | |
| 72 | ..... | 120 | 19 | 21 | 26 | | | | | | |
| 108 | 120 | 96 | 20 | 22 | 25 | | | | | | |
| 108 | 120 | ..... | 19 | 21 | 24 | | | | | | |
| 108 | ..... | 120 | 21 | 23 | 27 | | | | | | |
| wider than 108 | 132 | ..... | 22 | 24 | | | | | | | |
| | ..... | 132 | 23 | 26 | | | | | | | |

Rolled Round Copper, ¾ inch diameter and over, ₩ lb 18¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of Sheet Copper required to cut them from.
Cold or Hard Rolled Copper, 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₩ lb advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

#### Planished Copper—

1¢ ₩ lb more than Polished Copper.

#### Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb ..... 22¢
12 oz. and up to 14 oz. to square foot, ₩ lb ..... 24¢
10 oz. and up to 12 oz., ₩ lb ..... 25¢
Lighter than 10 oz., ₩ lb ..... 28¢
Circles less than 8 in. diameter, 2¢ ₩ lb additional.
Circles over 13 in. diameter are not classed as Copper Bottoms.

#### Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

*Last Feb. 20, 1901.*

| | | | |
|---|---|---|---|
| Nos...0000 to 8 | 9 and 10 | | 11 and 12 |
| Base | ½¢ | | ¾¢ ₩ lb adv. |
| Nos..... 13 | 14 | 15 | 16 |
| | ¼¢ | ½¢ | 1¢ ₩ lb adv. |
| Nos..... 17 | 18 | 19 | 20 |
| 1¼¢ | 2¢ | 2½¢ | 2¾¢ ₩ lb adv. |

#### Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

| Stubs' W.G. | B. & S. W.G. | ¼ | 5-16 | ⅜ | 7-16 | ½ | 9-16 | ⅝ | ¾ | ⅞ | 1 | 1¼ | 1½ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-11 | 3- 9 | ... | ..... | ... | ..... | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 12 | 10 | ... | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 13 | 11 | ... | ..... | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 14 | 12 | ... | 41 | 37 | 35 | 33 | 31 | 30 | 29 | 28 | 27 | 25 | 24 |
| 15 | 13 | ... | 42 | 38 | 36 | 33 | 32 | 31 | 30 | 30 | 28 | 26 | 25 |
| 16 | 14 | ... | 43 | 39 | 37 | 34 | 33 | 32 | 31 | 30 | 29 | 26 | 25 |
| 17 | 15 | ... | 44 | 40 | 38 | 35 | 34 | 33 | 32 | 31 | 30 | 27 | 26 |
| 18 | 16 | 61 | 46 | 42 | 39 | 36 | 35 | 34 | 32 | 31 | 30 | 28 | 27 |
| 19 | 17 | 62 | 47 | 43 | 40 | 37 | 36 | 35 | 34 | 33 | 32 | 30 | 29 |
| 20 | 18-19 | 64 | 49 | 44 | 42 | 39 | 38 | 37 | 36 | 35 | 34 | 32 | 31 |
| 21 | 20 | 66 | 51 | 46 | 43 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 |
| 22 | 21 | 71 | 56 | 48 | 44 | 42 | 41 | 40 | 39 | 38 | 37 | 37 | 36 |
| 23 | 22 | 76 | 61 | 50 | 46 | 44 | 43 | 42 | 41 | 40 | 39 | 39 | 39 |
| 24 | 23 | 81 | 66 | 53 | 48 | 46 | 45 | 44 | 43 | 41 | 40 | 40 | 41 |
| 25 | 24 | 86 | 71 | 56 | 51 | 49 | 47 | 46 | 45 | 43 | 43 | 44 | 45 |

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

#### Iron Pipe Sizes—Brass

| ⅛ | ¼ | ⅜ | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 6 inch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 22 | 20 | 27 | 21 | 21 | 21 | 21 | 21 | 21 | 23 | 23 | 25 | 27 | 28 | ₩ lb |

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

#### Brazed Brass Tubing.

(*To No. 19, inclusive.*) Jan 6, 1898.
Brown & Sharpe's gauge standard.

| | Per lb. |
|---|---|
| Plain Round Tube, ⅛ in. up to 2 in..... | $0.35 |
| " " ⅜ " ⅝ " ..... | .36 |
| " " ½ " ¾ " ..... | .38 |
| " " ⅝ " 1 " ..... | .41 |
| " " 5-16 " 1¼ " ..... | .48 |
| " " ¼ " 1½ " ..... | .65 |
| " " 3-16 " 2 " ..... | 1.00 |
| " " ⅛ " 3-16 " ..... | 1.50 |
| Smaller than ⅛ inch..... | Special |
| 2 inch to 3 inch, to No. 19, inclusive..... | .35 |
| 3 inch..... | .40 |
| Over 3 inch to 3½ inch, inclusive..... | .45 |
| Over 3½ inch..... | .50 |

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5..... 45%

#### Rod and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

| Common High Brass | in. | in. | in. | in. | in. | in. | in. | in. | in. |
|---|---|---|---|---|---|---|---|---|---|
| Wider than | 2 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | |
| and including | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | |
| To No. 20 inclusive. | .22 | .23 | .25 | .27 | .29 | .31 | .33 | .36 | |
| Nos. 21 22, 23 and 24. | .23 | .24 | .26 | .28 | .30 | .32 | .34 | .37 | |
| Nos. 25 and 26 ..... | .23 | .24½ | .27 | .29 | .31 | .33 | .35 | .38 | |
| Nos. 27 and 28 ..... | .23 | .25 | .28 | .30 | .32 | .34 | .36 | .39 | |

| Common High Brass | in. | in. | in. | in. | in. | in. | in. | in. |
|---|---|---|---|---|---|---|---|---|
| Wider than | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |
| and including | 28 | 30 | 32 | 34 | 36 | 38 | 40 | |
| To No. 20, inclusive .. | .39 | .42 | .46 | .50 | .55 | .60 | .65 | * |
| Nos. 21, 22, 23 and 24. | .40 | .43 | .47 | .51 | .56 | .61 | .66 | |
| Nos. 25 and 26 ..... | .41 | .44 | .48 | .52 | .57 | .63 | .71 | |
| Nos. 27 and 28 ..... | .42 | .45 | .49 | .53 | .58 | .65 | .75 | |

* Special prices not less than 80 cents.
Add ½¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 35%

#### Wire in Coils. List February 26, 1896.

| Brown & Sharpe's gauge the standard. | Com. high brass. | Low brass. | Gilt's bronze and copper |
|---|---|---|---|
| All Nos. to No. 10, inclusive.... | $0.23 | $0.27 | $0.28 |
| Above No. 10 to No. 16..... | .23½ | .27½ | .28½ |
| No. 17 and No. 18..... | .24 | .28 | .29 |
| No. 19 and No. 20..... | .25 | .29 | .30 |
| No. 21 ..... | .26 | .30 | .34 |
| No. 22 ..... | .27 | .31 | .35 |
| No. 23 ..... | .28 | .32 | .36 |
| No. 24 ..... | .30 | .34 | .38 |
| No. 25 ..... | .32 | .36 | .40 |
| No. 26 ..... | .35 | .39 | .43 |
| No. 27 ..... | .38 | .42 | .46 |
| No. 28 ..... | .42 | .46 | .51 |
| No. 29 ..... | .45 | .49 | .54 |
| No. 30 ..... | .48 | .52 | .58 |
| No. 31 ..... | .51 | .55 | .67 |
| No. 32 ..... | .55 | .59 | .72 |
| No. 33 ..... | .59 | .63 | .89 |
| No. 34 ..... | .64 | .68 | .95 |
| No. 35 ..... | .70 | .74 | 1.30 |
| No. 36 ..... | .76 | .80 | 1.50 |
| No. 37 ..... | 1.00 | 1.04 | 1.70 |
| No. 38 ..... | 1.30 | 1.34 | 2.00 |
| No. 39 ..... | 2.00 | 2.00 | 3.25 |
| No. 40 ..... | 2.60 | 2.60 | 3.75 |

Discount, Brass Wire, 37½%; Copper Wire, Net. List November 16, 96.
Spring Wire, 2¢ ₩ lb advance.

#### Tobin Bronze—

Straight, but not turned, Rods, ⅜ to 3 in. diameter, ₩ lb, net..... 20¢
Finished Piston Rods, ⅜ to 3½ in. diameter, ₩ lb net. 21¢
Other sizes and extreme lengths, special prices.

#### Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb
Western Spelter..... 4½@4¾¢

#### Zinc.

Duty: Sheet, 2¢ ₩ lb.
600 lb casks..... 6¾@7 | Per lb..... 7¼¢

#### Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 3½¢ ₩ lb.

| | |
|---|---|
| American Pig..... | 4.40@4.45¢ |
| Bar..... | 5 @5¼¢ |
| Pipe..... | 6¾¢.....20% off |
| Tin Lined Pipe..... | 12½¢.....20% off |
| Block Tin Pipe..... | 35 ¢.....20% off |
| Sheet Lead, full rolls..... | 7¼¢.....20% off |
| Sheet Lead, cut..... | 7¾¢.....20% off |
| Old Lead in exchange, 4¢ ₩ lb. | |

#### Solder.

½ & ¼ guaranteed..... 16½@17½¢
No. 1..... 14 @16 ¢
Prices of Solder indicated by private brand vary according to composition.

#### Antimony—

Duty, ¾¢ ₩ lb.
Cookson..... ₩ lb 10½@10¾¢
Hallett's..... ₩ lb 8¾@8¾¢
U. S..... ₩ lb 8 @8½¢

#### Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.
No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting:
Small lots..... ₩ lb 37¢
100-lb lots..... ₩ lb 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots..... ₩ lb 34¢
100-lb lots..... ₩ lb 32¢
Aluminum Sheet, B. & S. gauge. 50 lb or more

| Wider than | 6-in. | 14-in. | 24-in. |
|---|---|---|---|
| And including | 14-in. | 24-in. | 30-in. |
| | ₩ lb. | ₩ lb. | ₩ lb |
| Nos. 13 to 19..... | $0.42 | $0.44 | $0.47 |
| No. 20..... | .44 | .46 | .49 |
| Nos. 21 to 23..... | .46 | .48 | .51 |
| No. 24..... | .46 | .50 | .53 |
| No. 25..... | .47 | .51 | .54 |
| No. 26..... | .47 | .54 | .59 |
| No. 27..... | .48 | .57 | .62 |
| No. 28..... | .48 | .57 | .64 |
| No. 29..... | .49 | .60 | .69 |
| No. 30..... | .50 | .64 | .77 |

*Note.*—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

| | | | |
|---|---|---|---|
| Larger than No. 9. | ₩ lb 40¢ | No. 15..... | ₩ lb 43¢ |
| No. 9 to No. 10.. | ₩ lb 40½¢ | No. 17..... | ₩ lb 50¢ |
| No. 11..... | ₩ lb 41 ¢ | No. 18..... | ₩ lb 55¢ |
| No 12..... | ₩ lb 41½¢ | No. 19..... | ₩ lb 60¢ |
| No. 13..... | ₩ lb 42 ¢ | No. 20..... | ₩ lb 65¢ |
| No. 14 ..... | ₩ lb 42½¢ | No. 21..... | ₩ lb 85¢ |

#### Old Metals.

*Dealers' Purchasing Prices Paid in New York.*

| | | |
|---|---|---|
| Heavy Copper..... | ₩ lb | 11 ¢ |
| Light and Tinned Copper..... | ₩ lb | 9½¢ |
| Heavy Brass..... | ₩ lb | 8 ¢ |
| Light Brass..... | ₩ lb | 6½¢ |
| Lead..... | ₩ lb | 3½¢ |
| Tea Lead..... | ₩ lb | 3½¢ |
| Zinc..... | ₩ lb | 2½¢ |
| No. 1 Pewter..... | ₩ lb | 16½¢ |
| No. 2 Pewter..... | ₩ lb | 9 ¢ |
| Tin Plate Scrap..... | ₩ ton | $6.00 @ 6.50 |
| Wrought Scrap Iron..... | ₩ gross ton | $10.50@11.00 |
| Heavy Cast Scrap..... | ₩ gross ton | $10.25@10.50 |
| Stove Plate Scrap..... | ₩ gross ton | $8.00@ 8.25 |
| Burnt Iron..... | ₩ gross ton | $5.00@ 5.50 |